Digital Sports Photography

Second Edition

G. Newman Lowrance with contributions by Andy Hayt, Jon Hayt, and Kevin Terrell
Foreword by Peter Read Miller

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Dedication

In memory of Larry Hastings.

May you rest in peace.

Foreword

I fly a lot in my job. Frequently, people sitting next to me on the plane ask me what I do for a living. When I tell them that I am a sports photographer, their response is usually something like this: "Wow, what a great job!" They're right. Sports photography really *is* a great job.

A sports photographer captures the graceful, the intense, the emotional, and the unexpected. Shooting sports allows you to enter that magical netherland between the intensity on the playing field and the energy of the crowd. You smell the burning shoe rubber as a basketball player makes a cut, feel the ground shake from a colossal hit on the football field, or recoil from the glass as two hockey players collide. Whether it's in front of 90,000 Rose Bowl fans or a dozen Little League parents, you still feel a wave of excitement and passion wash over you following a big score or a great play.

Usually the next question my seatmates ask is, "How do you get a job like that?" In my 40 years as a sports photographer, I've heard many individual success stories from hundreds of my colleagues. Every one is different; each person has proceeded according to his unique interests and abilities. One thing they all appreciate, however, is information on how their fellow photographers have advanced in the field and what skills and equipment they have used to make their pictures.

In this book, Newman Lowrance not only tells the story of his journey toward becoming a successful sports photographer, but he also presents a wealth of information from some of the best sports shooters and editors who have worked in the industry. In this book, he and his contributors cover basic and advanced topics of digital photography, discuss techniques and strategies for shooting many major sports, and include a great deal of general knowledge on sports photography that will be extremely beneficial for those who have ambitions in this field.

Whether it's covering the Olympics for *Sports Illustrated* or a local youth soccer game, shooting sports is one of the most exciting, challenging, and creative aspects of photography. Whatever your aspirations in this field are, this book will provide invaluable help and guidance.

—Peter Read Miller

Acknowledgments

To my wife Kami and my two sons, Jordan and Austin. You are the best rewards of life. Thanks for being there for me.

To my mother, who initiated, supported, and encouraged my photographic ambitions.

To my father, for introducing me to the world of sports and keeping me on the right path.

To my fellow contributors, Andy Hayt, Jon Hayt, Kevin Terrell, and Peter Read Miller, for their valuable time, efforts, and contributions to this book.

To Paul Spinelli and all of the gang formally known as NFL Photos. All of you were a class act, and I will never forget the good times.

To Megan Belanger, Erin Johnson, Karen Gill, Bill Hartman, Mike Tanamachi, Brad Crawford, and Larry Sweazy, who worked diligently to make this project a success.

About the Author

G. Newman Lowrance has been a professional photographer for more than 18 years, with a major emphasis in sports. His images have appeared in *ESPN The Magazine*; *Sports Illustrated*; *Sports Illustrated for Kids*; *Sports Weekly*; *The Sporting News*; *Official NFL Super Bowl* and *Pro Bowl* game magazines; NFL videos and team calendars; *NFL Insider* magazine; *The New York Times Magazine*; various covers and interior photographs for *Street & Smith's* sports annuals; *Athlon Sports* annuals; *ATS Consultants* annuals; *Human Kinetics* publications; DK publications; and Scholastic Inc. His photos have also appeared for various commercial usages such as DirecTV; Fathead; Time Warner, Inc.; and Reebok, Inc.

Newman's journey into photography started at Usdan's Center for the Arts on Long Island, New York, during high school. That background and passion for sports and photography evolved through his days in college. After leaving school and working as an engineer for the Boeing Company, Newman began his pursuit of sports photography by working part-time shooting high school football games for a newspaper and obtaining credentials for college and professional events. His big break occurred after moving to the Los Angeles area when the major source of photography for the National Football League, NFL Photos, recognized his skills. At NFL Photos, Newman worked his way up to become one of their most published photographers. He was promoted to a staff position with WireImage before returning as a freelance photographer for Getty Images. He also teaches an introductory sports photography course for BetterPhoto.com.

Andy Hayt has been a photographer for the past 41 years working primarily in sports. He was employed as a staff photographer with *The Los Angeles Times* and *Sports Illustrated* prior to becoming the director of photography for the *San Diego Union-Tribune*. At *Sports Illustrated,* he photographed 39 covers. He has been employed as a contract photographer for the National Basketball Association, photographing both portraits and game action. Recently, he completed a photo book for the San Diego Padres Baseball Club commemorating the building of its new ballpark, Petco Park.

Jonathan Hayt has been a professional photographer for 16 years with a background in location lighting and digital photography techniques. He is a nationally known freelance sports and editorial photographer. His client list has included positions as the team photographer for the NBA's Miami Heat and the NHL's Tampa Bay Lightning. He has contracted with numerous clients including the Upper Deck Co., *ESPN The Magazine*, Reuters, and The Associated Press. Prior to this, Jon was a staff lighting technician for eight years at *Sports Illustrated*. He was responsible for all western states' arena strobe and location lighting assignments, working with *Sports Illustrated* staff and contract photographers.

Formerly the NFL business manager with WireImage, **Kevin Terrell** was employed with NFL Properties, Inc. for 19 years. He served as a photo editor for six years before being promoted to managing photo editor in 1997. He has photographed numerous NFL games, including 13 Super Bowls. In addition, he wrote several articles for *NFL Game Day* and *NFL Insider Magazine*, including a physical fitness workout column with various NFL strength and conditioning coaches.

Peter Read Miller has been a staff and contract photographer for *Sports Illustrated* for more than 30 years. His work has appeared in *Time*, *Life*, *People*, *Newsweek*, *Playboy*, *National Geographic*, and *The New York Times Magazine*. His other clients include Nike, Adidas, Ford, Visa, Coca-Cola, Kodak, Canon Cameras, and the National Football League.

Peter has covered 7 Olympic games, 33 Super Bowls, and 17 NBA championships. He has also covered the World Series, the Stanley Cup, the Kentucky Derby, the NCAA Men's Basketball Final Four, and the World Championship of Freestyle Wrestling in Krasnoyarsk, Siberia.

Peter has taught sports photography at the Santa Fe Photographic Workshop, Rich Clarkson's Sports Photography Workshop, and the SportsShooter Luau. He currently teaches his own sports photography workshop in Denver in conjunction with Working with Artists.
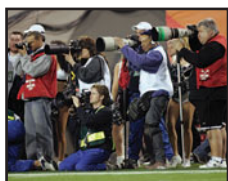
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Introduction

If you are interested in learning the basics of sports photography with an emphasis on shooting with digital cameras, this book is an ideal primer for getting you started or helping you to expand your skills and techniques. My fellow contributors and I have more than 100 years of experience shooting sports, and we have used this book as a forum for passing along a wide range of knowledge gained through hard-earned practical experience. Each of us started out shooting with traditional film cameras before digital cameras were invented, and each of us progressed in our usage of the latest equipment to keep pace with all the newest developments in digital photography. We have included many of our personal experiences along with our methods for shooting sports for clients who demand the highest image quality.

The book opens with my personal story and journey into the sports photography world. You'll find out what I encountered while trying to break back into photography after learning the fundamentals during my childhood and college years, and how a hobby and passion for sports photography eventually turned into a career.

Next, we cover the basic transformation that sports photography has undergone over the past few years as digital cameras have replaced film cameras, and how a sports photographer has changed his approach while adjusting to the digital realm. In addition, we have included discussions about the knowledge that you need to successfully work with digital imaging, including explanations about color management and camera setup to achieve images that clients can use easily. Finally, we discuss the workflow that is necessary in today's digital world.

We also focus on the various equipment options and basic concepts dealing with exposures, shutter speeds, and composition. You'll learn what it takes to capture great images while understanding these basic concepts. White-balance fundamentals and color settings for digital cameras are also discussed.

Chapter 4 covers what a photo editor looks for when reviewing and selecting photographers' images. Understanding these basic entities benefits you as you are shooting an event and helps immensely when you attempt to sell your images for possible publication.

We then concentrate on six major sports individually: baseball, football, basketball, hockey, soccer, and tennis. All these sports that we cover are shot most commonly at a professional level and are highly accessible at an amateur, scholastic, and semi-professional level. We base the discussions of techniques and methods

on shooting professional sports, which only helps you in understanding how to shoot the nonprofessional versions of these and other sports. We discuss photography basics, technical processes, and procedures and standards of professional comportment that apply to photographers at all levels. We help you set high standards and give you insights into how to shoot better photos, whether you are trying to break into the professional ranks or you just want to shoot sports as a hobby.
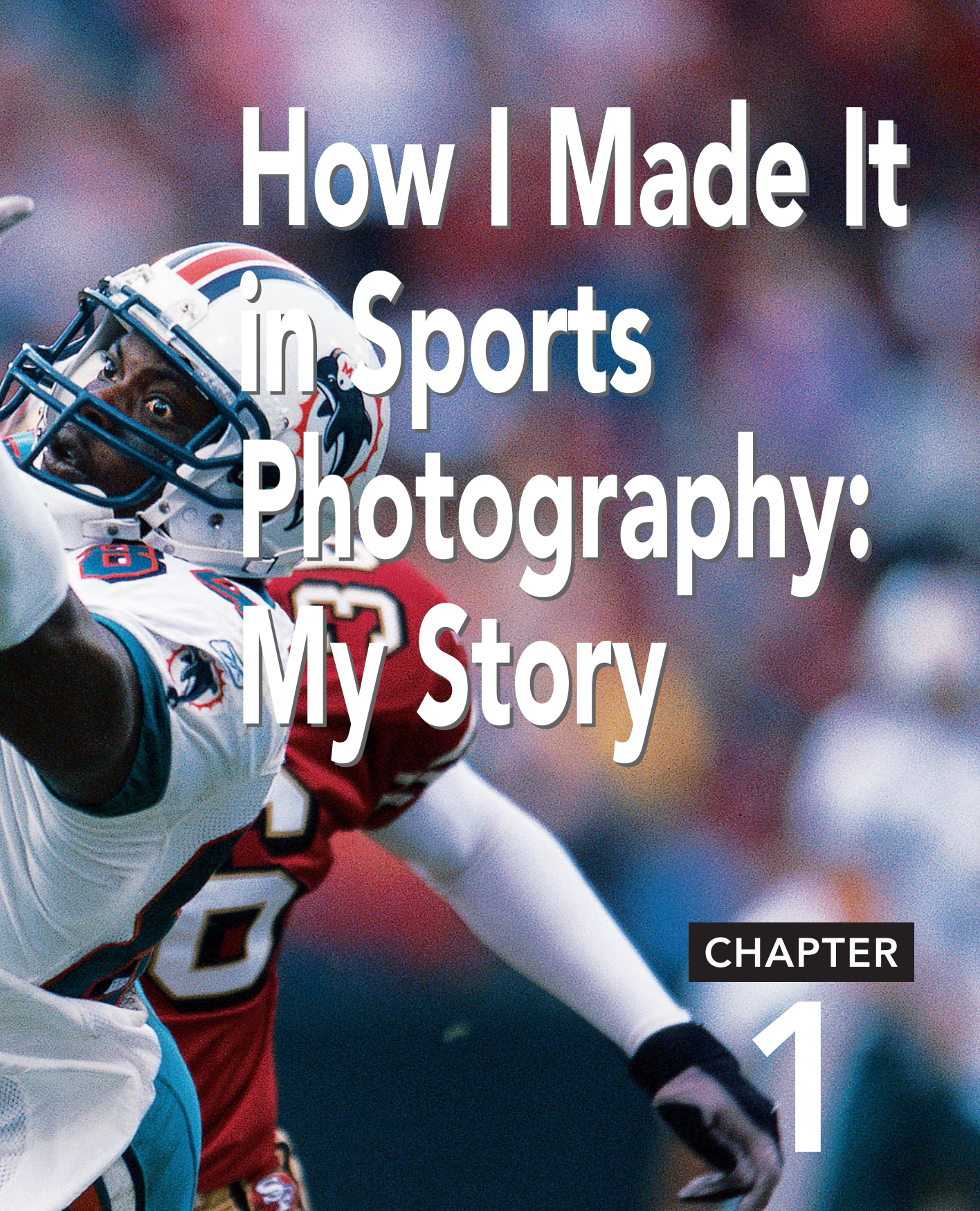
Each of these chapters examines a particular sport in detail and discusses the techniques we have developed over our careers. This range of experiences is brought to you so that you can gain a comprehensive overview of sports photography in addition to specific knowledge that will help you shoot better photos. Although we realize we could have included several other sports in this book, such as volleyball, golf, boxing, auto racing, and track and field, we discovered during our research that most professional photographers learned the fundamentals of photography by shooting youth and school sports such as baseball, football, and basketball, where it is easier to gain access for shooting experience. Besides, if you are just starting out, it might be difficult for you to obtain the proper credentials to photograph some of these other sporting events. Hopefully, after reading this book, you will have a better understanding of shooting techniques so that you can photograph practically any sport and obtain professional-quality results.

This book has a few other features of note. Between Chapters 6 and 7, you'll find a photo gallery of some of my favorite images. Chapter 8 includes a section on arena strobe lighting to give you a better understanding of what it takes to create light for an indoor sporting event. Concluding the book is a useful glossary that has a wealth of various photography terms.

Although most of the examples in this book are based on shooting professional sports, the concepts and techniques are, for the most part, common practice regardless of what level of play you are photographing. In many ways, shooting an event below the professional level actually offers greater access and a wonderful way to learn these basic techniques that can get you to the next level if that is what you are trying to accomplish. Also, depending on whether you are a high school student, a college student taking courses in photography, a parent wanting to take great action shots of your young athlete, or a current shooter just wanting to broaden your perspective, this book offers many examples of preparation, equipment use, and key positioning aspects while at an event, in addition to numerous image examples to better explain what we photographers were trying to achieve.

Every professional sports shooter has unique opinions and methods for capturing excellent sport photographs. In this book, we share ours and hope that they will make a difference in your sports photography aspirations.

How I Made It in Sports Photography: My Story

It seemed like I had waited for this day from the very first time I picked up a camera. Now, that might sound a bit dramatic, but having grown up loving pro football and photography, the opportunity to photograph a Super Bowl was about as likely for me as winning the lottery. Still, there I was preparing for my first Super Bowl between the New England Patriots and the Carolina Panthers in February 2004. I had started out on my own a few years earlier as a part-time photographer and met some great contacts, learned the trade, developed my eye for sports, and worked hard to get the opportunity to photograph one of the biggest sporting events in the world. Believe me, to finally be standing there on that sideline made all the time and effort I had spent in those few years well worth the wait. And knowing that I was working beside some of the top sports photographers was another true accomplishment in my mind. Plenty of photographers out there were more established and even famous in the sports photography world, but just having the opportunity to photograph a Super Bowl was like a dream come true. It was like winning my own personal lottery. Little did I know then that this was just another chapter during my journey in the sports photography world.

Starting Out

It all started innocently enough. As a kid with an old Kodak 126 format camera in my hands, I took photographs of everything and everybody. It seemingly was my destiny to become a photographer, but becoming a professional sports photographer was certainly not in my mind at that young age.

Growing up, I was always a huge fan of sports, especially professional football. The colors, the action, and the excitement of the game were elements that I loved then and still love now. Of course, I didn't know at the time that I would eventually shoot professional sports, have my work published, and make a living doing it!

Part of my football interest was generated from NFL films. In the days before cable, professional sports wasn't the oversaturated product that it is today, and games on television were mostly limited to weekends, except for Monday Night Football. When these NFL films were shown, I always watched. I loved the way the films portrayed the games so dramatically, how they brought you behind the scenes and showed you all the nuances of the game. I guess all of this correlated to my photography curiosity, too.

All of these elements enhanced my passion for photography. During my high school days, I spent each summer where I was born: in New York City. I always seemed to have a camera in hand while I was there. I often took the subways to Yankee or Shea Stadium and shot baseball games from the stands, and I walked around taking various shots of the city. You could say I was the typical tourist, but my photography interest was definitely in the works.

Noticing my strong interest in photography, my mother suggested that I go to a summer school in Long Island. The school had courses for all the arts and included photography classes that taught the fundamentals. For two summers, I attended the school and learned many different facets of photography. I loved learning about the processes of taking images, developing the film, and making prints. I can still recall the first time I saw a black-and-white image appear in the darkroom. Seeing that image suddenly emerge is still a vivid memory.

Besides teaching us how to develop film and print images, the school taught us about exposures, shutter speeds, apertures, and composition. During the class, our teacher assigned shoots for each weekend. For me, just being in New York City was an adventure that was a completely different world from the small Missouri town where I basically grew up, so I didn't have a hard time coming up with material for those assignments. Photography seemed almost like a natural instinct to me. By the end of that first summer, my mother purchased an enlarger for me to take home. I ended up building my own darkroom and used it throughout high school. To this day, I still have that enlarger. It's a reminder to me about the journey that photography has taken me on.

I took a brief break from photography during my first two years of college. In that time, I concentrated on obtaining the basic courses until I figured out what to do with the rest of my life. By my third year, I decided to take photography courses for a minor, and eventually, I worked for the university newspaper.

Just getting on the staff at the university was tough. I can't remember how many times I came into the office before they finally hired me. I guess that old saying of being persistent finally paid off. Luckily, the university supplied the best equipment available at that time: a Nikon F3 body and several lenses to use for the events. Although I didn't have a long lens, like a 400 mm, having a body that would shoot six frames per second was a benefit, especially while using manual-focus lenses and learning how to focus on the high-speed action. Being able to use this equipment was a huge advantage for me considering the budget of a typical student.

I ended up photographing all the university sporting events, from football, baseball, and basketball to rugby, wrestling, and soccer. I was unaware at the time of the great experience I was gaining not only from shooting the events, but also from meeting deadlines for the weekly newspaper and having full control of the images I would select for publication. The school staff covered the events, processed the film, and provided the newspaper editors with prints to run in the next weekly edition of the publication.

My First Professional Game

One of the other university staff photographers also worked for a local newspaper. He had a credential for an NFL game that he couldn't attend. Knowing that I would love to go, he gave the pass to me. Back then, your name wasn't required on the credentials, and the teams just mailed them to the various media outlets, so it wasn't a problem for me to get in and at least act like I knew what I was doing. The game was in St. Louis between the New York Giants and the St. Louis Cardinals (before the franchise moved to Arizona). I can still recall standing on the artificial turf field an hour before the game and looking around Busch Stadium. I couldn't believe that I was actually standing on the field for a professional football game. Before I knew it, the Giants were coming onto the field for their pregame warm-ups. Even now, I can visualize Harry Carson, a great linebacker, leading the team on to the field and yelling at me to "Watch out!" I was standing right where the team wanted to go. As the players ran past me, I was amazed at how big they really were. It was a lot different from the Division 1-AA games that I was accustomed to.

Because the game was a 3 p.m. start, I didn't have the best lighting in terms of daylight. It was like shooting a night game by the second half, but I didn't mind. That day probably gave me the best experience a starter could ask for. Although I only had an 80–200-mm zoom lens for action shots, a wide-angle lens, and my old Nikon FE2 camera, I was having the time of my life—and I was instantly hooked! I was shooting everything that moved and was taking full advantage of my first time being on an NFL sideline. I drove back to the university that night replaying the day in my head and wondered how and when I could shoot another NFL game, but it would be eight long years before I stepped on another NFL field. I graduated the following spring and went on to a professional career as an engineer with the Boeing Company in Wichita. By the time I made the transition from student to employee, I wasn't taking very many photographs. In fact, for five years, I hardly picked up a camera. That was about to change, though.

My first professional game occurred at old Busch Stadium in St. Louis. ©G. Newman Lowrance

Getting Back

In 1991, my father and I purchased Kansas City Chiefs season tickets. It was a great way for us to see each other more often, because we were coming from opposite directions. Sitting in those seats made me think again about being on the field and photographing sports. I ended up purchasing some used equipment the following year: a Nikon F3 body and a 300-mm f/2.8 manual-focus lens. At that time before security checks, I was allowed to bring that equipment into the stadium. I shot many photographs from our seats and had some reasonable success. Our seats were around the 10-yard line, 10 rows up, so when the teams came near us, it was a decent vantage point for shooting. I shot from those seats for

Before I made it back onto the field, I had some reasonable success shooting from the stands.
©G. Newman Lowrance

two seasons before I tried to make it back onto the field. I visited some local newspapers and showed them my portfolio from my college days. I knew my work was a little outdated, because it was material more than six years old, but I hoped someone might notice my potential.

My comeback didn't happen quite the way I wanted it to. I couldn't get a job with any of the newspapers. As a matter of fact, I couldn't even get work as a part-time shooter. I finally ended up offering my services to a weekly suburban paper to shoot the local high school games for free, provided they would allow me to use the newspaper's name to obtain credentials for college and pro games in the area. They agreed, and before I knew it, I was getting into as many games as I could. I would shoot the high school games on Friday evenings and give the film to their editor. The next day, I would drive up to Kansas State University or Kansas University for a college game. By Sunday, it was on to Kansas City for an NFL game.

This was where I really noticed the difference in the speed of the game and the size of the players from level to level. The field seemed almost to dwarf the high school teams, and it was pretty easy to follow the action, albeit in horrible lighting conditions. The Saturday college games were another step up, and by the NFL games on Sunday, I was definitely aware of the differences. That was a great learning curve in itself.

That first season back on the field was memorable for me. I was learning from my efforts and making contacts. I joined a lab where I could process my own film and make contact prints and enlargements with either black and white or color. I was slowly regaining what I had learned previously at the school in Long Island and the university.

It was also during this season when my first real break occurred. I met Tim Umphrey, who was then the head photographer for the *Chiefs Report*, a weekly publication produced in the Kansas City area during the football season. Tim was always friendly and helpful when I asked my many questions. After he taught me some of the basics, he eventually hired me to help out with images for the publication. Although I thought that I had a good idea of what to do, learning directly from a professional was a huge help to me. Previously, I had been shooting with automatic settings from the camera. I thought the images were okay, but some of them occasionally were over- or underexposed. Tim explained to me the reasoning for using a separate light meter and shooting with manual exposures instead of letting the camera decide. The differences were amazing! Suddenly, the subjects in my images appeared to pop out at me, and the exposures were definitely better. I realized then how much more there was to learn about shooting sports.

Over the next year, I eventually made my way into the local sports teams in Wichita, shooting for the local Central Hockey League team, the Thunder; the class Double A baseball team, the Wranglers; and baseball and basketball for Wichita State University. Suddenly, I was photographing year-round. I wasn't making a lot of additional income, but it was enough to start purchasing equipment little by little and continue my passion for photography. My images started appearing in the teams' media guides and yearbooks, but I wanted more. I still wanted to make it in the national scene and shoot more on the pro level of sports. But that was going to be tough to do living in the middle of Kansas!

In 1996, my regular job with Boeing changed. The company wanted me to move to the Los Angeles area to become a technical representative for all the outsourced work in the area. I immediately thought about all the sporting events that would be occurring in the area. My selections seemed limitless after living in Wichita, and Los Angeles had plenty to offer. I just had to figure out a way in.
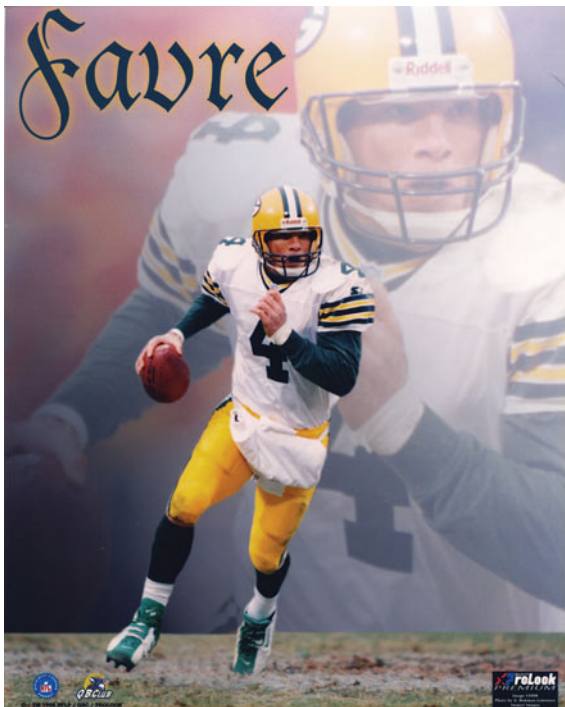
Working for ProLook led to my first licensed images being produced.
©G. Newman Lowrance/ProLook

Shooting at the Memorial Coliseum in Los Angeles was part of my new start in photography.
©G. Newman Lowrance

I eventually used my connections from the Wranglers, who were the Double A affiliate of the Kansas City Royals, and my affiliation with Wichita State to get into the Dodgers and Angels games. These organizations wanted to have images of the former players who passed through Wichita in their professional uniforms. Of course, for me, it was just a way to continue shooting and to make more contacts.

That summer, I photographed as many baseball games as I could. I was still meeting other photographers and learning as much as possible, but I decided it was time to get serious. I had heard about a sports photography workshop at the U.S. Olympics training facilities in Colorado. I thought that by attending, I would learn more from the world's top sports shooters. Photographers whose photo credits I had seen in *Sports Illustrated* were part of the workshop, offering feedback on our portfolios and showing us their work during slide show presentations. After being around 40 or so people who were interested in pursuing sports photography like I was, I felt it had been worth the time. I met some great individuals, and several are still friends that I keep in contact with to this day.

One of these individuals was a photographer from Dallas named Walt Smith. We had similar backgrounds and opinions, and we hit it off immediately. Walt had been shooting NFL games for years and had a way into the games through his roll as the official photographer for the Professional Football Referees Association. He also shot for a company called ProLook, which at the time had an NFL license and sold 8×10 photo prints for consumer sales and autograph signings. Walt had said he would help me get into NFL games if I could shoot some referee images for him. ProLook would also review my images to consider them for their products. This was a perfect opportunity for me. I knew that the only way to get better was to continue to shoot as often as I could, meet more people in the industry, and see what it might lead to.

I spent the next two football seasons shooting for Walt and gaining more experience. By this time, I had worked up to the Nikon F4 and then F5 auto-focus camera bodies, and a 400-mm f/2.8 auto-focus lens. Now I had the equipment, and I had a way in. At that point, I wondered how I could find another outlet to have more of my work published.

Unfortunately, over the next few years, I started to feel discouraged with the whole situation. It was hard even with Walt's connection with the referees to get into games because, on occasion, we were denied credentials. My regular job was keeping me really busy, and working over 60 hours a week wasn't out of the ordinary. I also got married in the fall of 1996. Life was changing. I started to understand how competitive the profession was. Nonetheless, I realized it still took a great eye and anticipation to capture a good image, and that's what kept me going. But I was beginning to give up hope for making it any further, and I revised my thinking again to enjoying photography more as a hobby.

After moving to Southern California, I eventually shot USC, UCLA, Dodgers, and Angels games.
©G. Newman Lowrance

I kept shooting in this manner until I eventually worked with a small local agency in the Los Angeles area. At least through them, I could get into the local college games at USC and UCLA, and I continued to shoot the Dodgers and Angels games; however, I still felt like I was stuck in my pursuit. I wasn't getting anything major published, except on occasion I would have photos in an annual or monthly newsstand publication. It was nice to see my name on the credits, but I knew my work was good enough to be published more often. I just felt like I hadn't gotten the chance. Little did I know I was about to get the opportunity.

My Big Break

The great thing for me about living in Los Angeles (besides the weather) was being just a one-hour flight away from the Bay Area or Phoenix, and being just a short drive away from San Diego. Because of this, most of the NFL games that I covered were Chargers, Raiders, 49ers, or Cardinals games. I was always running into other shooters whom I recognized on the sidelines, and I eventually came to know many of them. One of these photographers was Kevin Terrell, who was employed by NFL Photos, the league's direct source of photography. I didn't realize at the time that Kevin was their managing photo editor, who worked under Paul Spinelli. I had heard of Paul before, but I had never sent any images or my portfolio to the company.

I would often run into Kevin at games and other occasions at LAX airport before flights to a game. He sometimes asked to see my work. I figured he just wanted to give me some advice. This went on for a couple of years when finally, late in the 1999 season during a game in San Diego, he asked me, "Are you ever going to send me some of your work to look at?" I didn't really understand why he had kept asking me, figuring he was just a photographer for the NFL. But this time he gave me his business card that said he was the managing editor for NFL Photos. I was almost in a state of shock. I had no idea he was an editor. I had practically given up on ever latching on with an organization or magazine. I told him I would send my portfolio right away.

That night, my drive home from San Diego flew by because I was thinking about which images I should send in. I knew my work was good enough; maybe this would finally be a real opportunity. I searched through my last few years of work, had prints made up, bought a nice portfolio book to include my images, and sent them and a few slides to Kevin.

I finally found a home with NFL Photos and eventually worked my way up.
©G. Newman Lowrance

Two months later, my wife Kami phoned to tell me a FedEx package had arrived from the NFL office. Of course, I couldn't wait to get home. "This is it," I thought. "I either go on with this pursuit, or it will just have to remain a hobby." I opened the package and read the letter. Kevin liked the work and kept a few of my slides for the NFL library for future considerations. He also added me to their photographers' list. In short, I was in.

"Welcome aboard" was Kevin's closing. Those two words said it all. Although I still had to pay my own expenses to games, I would now be one of NFL Photos' contributing photographers. Best of all, my work would be reviewed and added to their library for possible sales. Now all I had to do was produce!

Shooting for the NFL

My first game for NFL Photos was a preseason game in San Diego against the Minnesota Vikings. I'll always remember being somewhat nervous, just knowing I would be turning in my images to be edited and critiqued. Even the drive down to San Diego was an adventure, because traffic was worse than usual, which is saying a lot for southern California. What usually is less than a two-hour drive took me more than four hours to get to the stadium, and I barely made the kickoff. I sure didn't plan to shoot my first game for them in a panic, but once I started shooting, it was business as usual.

Luckily, a preseason game is just that, for the players and photographers both. It's a warm-up for all to prepare for the upcoming season. As it turned out, it was my own warm-up and finally a real beginning for me to get somewhere in this world of sports photography. It was also the start of good things to come.

My first year with NFL Photos was definitely a learning experience. My sales seemed slow at first, but after speaking to other shooters, I found out that wasn't a bad sign. They all went through the same thing. With such an enormous number of images arriving into the offices on a weekly basis from all the photographers, it took time for my images to build up in their library for all the various publications. However, once it got going, I was extremely pleased. Before I knew it, I was being published consistently in Super Bowl programs, Pro Bowl programs, *NFL Insider* magazine, *NFL Gameday*, NFL calendars, NFL videos, and so on. I was shooting preseason, regular-season, and play-off games all over the country, and I enjoyed traveling to the various venues. It was the crowning achievement to all the years of just getting in to shoot, to learn and get better and, finally, to be noticed.

This image will always remind me what I know about editing. I almost didn't send this to NFL Photos figuring it was nothing special. It ended up being selected as one of the "Best Shots" of 2001. ©G. Newman Lowrance

As 2003 came along, I had decided to leave the aerospace industry to a certain extent, and my family and I moved to the Kansas City area. Although I still did some engineering work part-time out of my home, I really wanted to concentrate on photography and give it a fair shot. NFL Photos didn't have a shooter living in the area, so the Kansas City Chief games would be my primary coverage, and another opportunity for me to seize.

Unfortunately, I only worked with NFL Photos during their final four seasons before the company was dissolved, but it ended on a high note. It was at this time when I was selected to shoot my first Super Bowl, which in turn was the last Super Bowl that NFL Photos would cover. Not only was it a great game that came down to the wire, but it was also a fitting conclusion of my ultimate goal to photograph such an event. The only downside was that the other shooters and I knew this was the final game. The NFL league office had decided to shut down

Shooting my first Super Bowl in February of 2004 was a big achievement in my personal goals.
©G. Newman Lowrance

the photo services department in the fall of 2004 and outsource the league's photography to two separate companies: Getty Images and WireImage. While Getty had been the more established company, WireImage was still a new agency in the sports world. Both companies split the commercial license with the NFL for sales and had the option to bring in some of the contributing NFL photographers that I was a part of.

Although most of us had offers to go with either company and to continue shooting, the idea that NFL Photos would no longer be in existence was a hard realization for me to accept. As I look back now on all the big games I photographed, the people I met, and the working relationships I established, I realize what an absolute pleasure it was to have been a part of that. And even though it was a sad day for me to see it end, the satisfaction of my success during that time will always reside with me, and working for NFL Photos was a major part of that.

Moving Forward

As the Super Bowl ended, I knew that I would eventually have to make a decision about my future. Throughout the spring of 2004, I had discussions almost daily with several other NFL photographers who were in the same situation, and we were all trying to decide what to do. After weeks of trying to come up with an answer, I ultimately made the decision to sign with WireImage. Since they were the newer company with a smaller number of staff photographers, I thought I might have more opportunities to shoot bigger events and a better chance of making a name for myself. As I look back now, it was the right decision at the time. I did indeed get many opportunities, and I photographed many big events. Still, it was a tough decision, but at least I was fortunate enough to have a choice in where I ended up. I figured all I could do was continue to work hard and continue to learn.

By that 2004 football season, the sports photography world had gone exclusively to using digital images. Now I would upload my digital images live from the event, unlike the old way of sending slides to NFL Photos. This meant my posted images were available immediately after games for various types of usages, but mostly editorially for magazines about to go to print each weekend. This was a major advantage for possible sales. With the "live" site of my images, clients could see my work immediately. That paid off for me that first year with WireImage during one stretch in October. *ESPN The Magazine* ran my images in

ESPN The Magazine published this shot of linemen battling in their "Zoom" section, my first benefit of having my images posted to a "live" Web site available for clients. ©G. Newman Lowrance

back-to-back issues in their "Zoom" section, which was followed the next week with a leadoff double-page spread in *Sports Illustrated*. I was thrilled with the recognition that came with this type of accomplishment, but at the same time, I wasn't that surprised. I knew my work had improved a great deal. I just needed more exposure, and the live site definitely gave that to me.

My first season with WireImage ended up being quite successful. It concluded with another selection to the Super Bowl team, this time in Jacksonville between the New England Patriots and the Philadelphia Eagles. It still made me think back to shooting those high school games for free, and I realize now that it was well worth all of the time and effort. All those years of slowly upgrading my equipment, improving my skills, and making more contacts had turned out to be very beneficial for me.

After that first football season with WireImage, I was approached to become a staff photographer for the company. I would now be a professional sports photographer on a full-time basis. For someone who had just started out with photography as a hobby, it was very rewarding to achieve this type of position. From that moment, I went on to photograph some of the biggest sporting events our sporting world has to offer—from NFL Play-Off games to Super Bowls, to big college football battles between Ohio State and Michigan or USC and Notre Dame, to MLB baseball play-offs, the World Series, and on and on. It was nonstop travel from one game to the next and one sport to the next. At times, the travel, shooting, and editing were exhausting, but I guess I had gotten what I wanted. Throughout all that driving and flying to events that I was assigned to cover, I often reflected on just how fast things had changed for me once I had gotten my opportunity with the NFL.

My first football season with WireImage concluded with the Super Bowl in Jacksonville, Florida, between the New England Patriots and the Philadelphia Eagles. ©G. Newman Lowrance

Two more years of covering events all over the country eventually led to my favorite published image, from Super Bowl XL in Detroit. It was a photograph of the game's Most Valuable Player, Hines Ward of the Pittsburgh Steelers. *Sports Illustrated* had selected it for the cover of their Super Bowl Commemorative issue. It wasn't the usual action shot; it was more of being in the right place at the right time. The funny thing is, that shot never would've happened had I not been right at that spot beside the end zone. I had just come down to that side of the field a play before and noticed several photographers in the back of the end zone where I typically like to be. I decided that I might as well set up elsewhere, and perhaps I could get something different from another location. As luck would have it, the Steelers ran a reverse, and the receiver passed the ball to Ward, who jutted into the end zone right in front of me. He then turned around and walked toward me as he pointed "number 1" into the crowd. I sat there shooting, but I never thought that I had just captured a cover for *Sports Illustrated*. That was the furthest thing from my mind. *Sports Illustrated* made the cover even more enjoyable when they sent me a poster-sized print to hang in my office. I guess time will tell if that turns out to be my one and only cover for them, but seeing that print will always bring back memories of that moment.

WireImage had become more successful by 2006, and I continued to see many of my images published nationally on a regular basis. Everything I ever wanted to accomplish with photography and then some had materialized. But another change was about to occur. In the spring of 2007, Getty Images purchased WireImage. It was a reminder of how fast things change. I once again photograph events as a freelancer, but now as a contributor to Getty Images. The nice part is that I again have the opportunity to shoot games with some of my former colleagues from the NFL days, as all of us are back together again. To this day, we still remain almost like family. We're a small group, but one that is respected in the photo industry and one that I'm appreciative of being associated with.

Who knows what the future holds? The industry will continue to evolve, and each of us as photographers will have to change with the times. Regardless of what unfolds, I can always look back on how I started and what I accomplished. Ultimately, I've achieved the goals that I set for myself, and it's been a fulfilling dream that I've lived out. Anyone else who works hard, is determined, and makes the effort can do the same thing. Even after all these years, I'm amazed by this world of sports photography. Capturing a great image while freezing a moment in time is still a thrill for me. I imagine it always will be.

After taking a staff position, I traveled all over the country to cover sporting events that included Super Bowls and World Series, among others. ©G. Newman Lowrance/WireImage
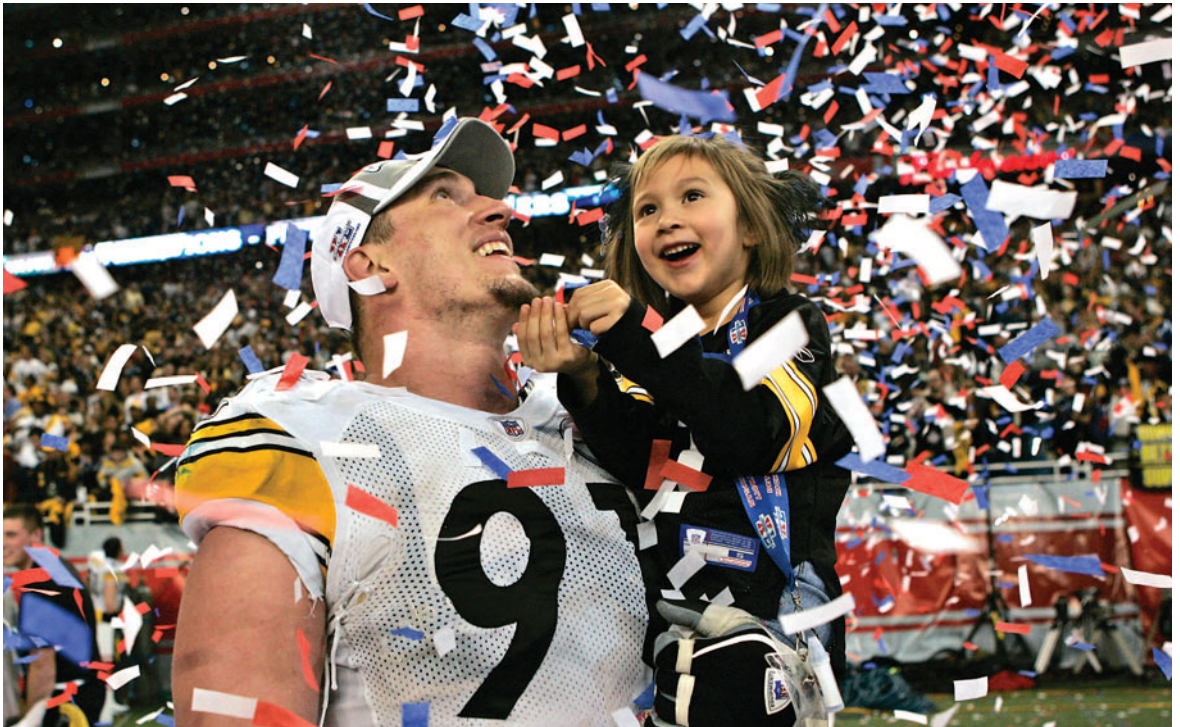
A little luck: I was in the right place at the right time for my *Sports Illustrated* Super Bowl cover.
©G. Newman Lowrance/*Sports Illustrated*

©G. Newman Lowrance

From Film to Digital: The Transformation

For those of you just starting to take digital photographs, having missed out on the old days of shooting film and chrome, I thought it might be helpful for you to understand how the photo industry has evolved over the past few years. It wasn't always as it is now: shooting with auto-focus technology and digitally. As a sports photographer since the early 1990s, I've seen my share of changes in the photo industry. From the old manual-focus bodies and lenses to the revolutionary digital world, photography has undergone many significant advances in the past several years, with undoubtedly many more to follow. During my college days, I started shooting sports with a motor-driven Nikon F3 camera, which was a manual-focusing camera and at the time probably the most widely used and fastest camera in terms of frames per second for photographing sporting events. It was also an extremely durable body, and at 6 frames per second, you were able to capture some great images with that type of speed versus using a camera without a motor drive. During this period, most photographers also were equipped with manual-focus lenses, but soon afterward, auto-focus lenses made their appearance. These lenses have since improved their optic quality, become lighter in weight, and provided faster auto-focus tracking capabilities. Film format cameras also improved, with Nikon and Canon eventually releasing film bodies that shot 8 and 10 frames per second, respectively. Although all of these improvements helped the shooter immensely, the industry would soon discover the biggest change of all: the digital camera.

Digital Choices

When I first began shooting sporting events, the only choices I was concerned with were what kind of camera to purchase and what brand to choose. Although I saw several makes and models on the sidelines over the years, Nikon and Canon always led the sports world in terms of usage then, and they're still the brand that most professional sports photographers choose today. If you are fortunate enough to have either system, you are probably serious about your photographic adventures or at least have the financial means necessary to obtain such equipment. Both Canon and Nikon are the top of the line for sports photography and provide the latest digital technology advances available. They also consistently battle for sales and usage. This benefits photographers, because the two companies constantly develop new digital bodies as the technology continues to improve.

Digital Advances

With digital cameras now selling more than film-format cameras and the technology for these digital cameras changing practically every day, it's difficult

expense-wise to keep up with all the advances. The advances in digital cameras today are similar to those in the computer technology field. In the film days, you didn't see these types of frequent technology advances. You could use the same film body for many years. Today, however, new digital bodies are being released so often that your digital camera is practically outdated from the minute you purchase it.

Whether for the good in terms of technology or the bad in terms of expense, digital photography has replaced film photography on the sidelines of the sporting world. So far I've been able to keep up with the latest technology advances, even though they've been expensive. For example, in the past four years alone, I have purchased a pair of the latest digital cameras not once or twice, but three times! I know many other professionals who have purchased even more, but you get the idea. To make matters worse, the cost of digital cameras is higher than the old film cameras. Even before digital cameras started to appear, the latest professional film bodies could cost you as much as $3,000, so it wasn't an inexpensive situation anyway. However, obtaining the latest professional digital cameras costs you even more—anywhere from $4,000 to $8,000 depending on the model and brand.

Professional Versus Nonprofessional Cameras

Before digital photography, you could manage using a nonprofessional camera using film, because a good shooter could still obtain great results given his skill level. The bottom line was that film was film. But digital is different, because these cameras have several distinctive differences in terms of specifications, like image sizes, file sizes, pixel count, white balance options, exposure metering, motor drive speed, buffer size, and so on. With film bodies, professional sports shooters were mainly concerned with how fast the motor drive was. Now the choices of digital bodies are seemingly endless for both the consumer and professional photographer. The professional-level digital cameras are faster, allow for more control, and for the most part have larger and better imaging specifications than the less expensive consumer-type digital versions. Both Nikon and Canon have produced mid-range digital cameras that fall between the consumer and high-end professional cameras. These cameras do a remarkably fine job but have certain limitations, such as speed and full professional-level customization. Granted, it is your decision whether to keep up with all the changes, but if you choose not to invest in the latest technology, you will probably find yourself left behind the majority of professional shooters who do. Just remember that you can tailor your digital camera purchases to meet your photo needs and budget and still get professional-level results.

The Film Process

I would like to mention the basic procedure for film usage before shooting digitally brought us up to the current methods. For the film shooters of the past 25–30 years, the process was pretty standard. The majority would photograph the event, develop the film, print a proof sheet from negatives or view the slide film images with a loupe, and then select the best pictures. Perhaps they made prints to submit for publication, depending on what they were shooting and whom they were shooting for. On the other hand, many newspaper photographers who shot color negative film took their film back to their office after the event for processing, editing, scanning, or printing. Users of transparency film had a similar process except that they had individually mounted positive film images to send off for the editors to choose from.

During my first years as a freelance photographer, I generally took my slide film to an E-6 film-processing lab and then waited for them to complete the processing, because the only deadline I had through my work with NFL Photos was to have my film or slides to them within 2 weeks of the game. This processing step took extra time and money that I don't miss in today's digital world, but I still miss editing my chrome images through a loupe and seeing the vibrant colors of transparency film. Of course, one disadvantage for users of film-format cameras is that you don't know if you have captured a great shot until you process the film. In some ways, waiting to see your images after processing is a nice mystery. Coming across an image that captures a great moment is always special. Conversely, you might think that you took a great shot, but it didn't come out quite the way you first imagined. These procedures for using film, although now presently outdated for most professional sports photographers, served a great purpose for many years. Although using film is still an option, especially for youth sports or for new photographers starting out, it is no longer used for major sports publications in today's digital world.

Scanners

As the digital world started to creep in, personal desktop scanners became a major tool for photographers wanting to submit digitized images or to store digital copies of images on their computers. Before digital cameras were available or affordable, computer memory and storage costs were at a premium. The boom of the computer age had yet to begin, but you could see even then that it was only a matter of time before the technology advanced completely to the digital realm. Besides being able to convert film images to digital files for archiving purposes, scanners allowed you to e-mail preview images to various clients for

a quick look. However, the most common method was to submit original film so that the publisher could scan it. The main use for desktop scanner–derived scans, besides client previews, was for newspaper and wire service submissions, because the output was generally not up to high-end printing standards.

Scanners in the Marketplace

The number of manufacturers that produce the high-end press scanners such as drum and high-resolution flatbed scanners has decreased over the past several years due to a lack of sales. Only a few manufacturers now produce high-end film scanners, and there have not been many major technological advances in hardware in the past few years. Most of these companies have simply tried to keep up with computer operating system changes and connectivity while making only minor hardware changes. The only big changes that have occurred have been with the desktop scanners. Cheap flatbed scanners are now capable of decent output, and the desktop film scanners from Nikon and Hassleblad/Imacon currently produce scans that are closing in on the scans that the high-end output houses produced a few years ago. There is a growing market for desktop scanners for professional and consumer digital photographers alike. Because computer storage has become so inexpensive and available, it is a good time to start scanning and archiving old, fading film. You can get a good desktop scanner for less than $1,500 including software, which is still cheaper than buying most high-end, large-megapixel digital cameras. In other words, there is still life left in your current film cameras. Don't forget that you can also create almost any file size you need with a scanner.

Role of Scanners in Photography Today

From the film-format days, I have accumulated a large archive of older photos that could possibly be gaining historical and resale value. As mentioned earlier, film shooting required that original material was sent to the client and then scanned for the client's use. Now most clients want digital images delivered to them so they can avoid the cost of scanning and the liabilities of handling original film. They have embraced a digital workflow and don't want to handle film. Most agencies and clients have developed FTP sites in which you can upload digital images directly to a server, and the rest accept digital images on CDs and DVDs. Most of the major stock photography agencies now sell only digitized content because they no longer want to risk sending original film images. This presents a new dilemma for photographers, because the only images that sell are digital, and most digital images have only been produced in the past few years, as digital cameras have become the mainstream. Many photographers now

invest in desktop scanners so that they can digitize their older film stock for submission to stock agencies and clients.

A Nikon Super Coolscan 5000 with Lasersoft's Silverfast software produced many of the scanned film images in this book. It is not difficult, with good color profiling of the scanner (a 35-mm color target is supplied with the Silverfast software), to produce excellent scans that are dust free, thanks to Digital Ice dust removal software. My enthusiasm for digital photography has made me realize that there is going to be a big demand for scanned older images. There are ongoing efforts to scan film images shot before the year 2000, but a large percentage of material still needs to be digitized. As this film and its content ages, there is going to be a much greater demand for archiving in a digital format. That is why film and scanners still play an important role in the world of photography.

The basic film cameras produce a unique look compared to digital cameras because all prime lenses retain their original focal lengths (1:1 ratio) and the corresponding effects of the original focal lengths. This is especially true with the short focal length and wide-angle lenses, because you lose their qualities when you use them on most digital cameras. The small CCD (charged coupled device) and CMOS (complementary metal-oxide semiconductor) sensor chip areas of many digital cameras reduce the image area that is captured and multiply the focal length of all lenses. Although we are starting to see full-frame, or 1:1 ratio, digital cameras manufactured, the majority of digital bodies still have some kind of multiple factor. The frequently used factors of 1.3X to 1.5X (depending on the model and brand) in lengthened focal length mean that you can capture many effects only with film cameras or these new full-frame digital cameras when shooting with wide-angle lenses.

First Usage of Digital Cameras

Wire service photographers, who worked for such agencies as the Associated Press, United Press International, Reuters, and a few larger newspapers, were the first main users of digital cameras starting in the early 1990s. These first digital cameras were bulky, had a slight delay on the shutter release button, and were slow in terms of consecutive bursts, or frames per second. They also suffered, by comparison to today's cameras, from poor image quality, minimal storage capacity, and poor battery life. They were mostly hybrid cameras that were the result of marrying electronic film bodies to digital backs and self-contained battery packs. Kodak was the leader in producing these cameras and developing the early digital camera technology. These first digital cameras were expensive, with costs almost three to seven times that of current cameras. Of course, at the time, they were the latest technology available, and the industry welcomed them.

Another limiting factor in the daily use of these early cameras was the poor browsing and imaging software and computers that had limited storage capacity and processing speeds. The original image-viewing software was proprietary to the camera manufacturers, and Adobe Photoshop wasn't particularly easy to use until version 4.0 was introduced. Also, the Internet was just developing, and transmission of digital files was done mainly on analog phone lines using early laptop computers and self-contained scanner/transmitters made by AP/Leaf Systems. Today's more elegant software, high-speed large-capacity computers, and high-speed data lines have made this work quick and effective for deadline-oriented agencies and publications. The digital photography world has seen a level of progress since the early 1990s that equals the rapid advance in computer technology during this same period.

The initial users of this early digital equipment had to adjust to shooting events digitally with the delay that I mentioned, and they were required to send images to various newspapers or agencies during and after an event using a laptop computer. The upside is that photographers no longer had to waste time processing or developing film in a darkroom. For those wire shooters who had previously used film, stadiums at the major college-level and professional ranks usually provided darkrooms for these press photographers to process the film right there at the event. Today, photographers don't need to process film, but merely edit and caption the images on a computer before e-mailing or using a File Transport Protocol (FTP) process to send images directly to their client.

The biggest advancement in digital photography arrived in 1999 when Nikon introduced the D1 digital camera body. It sold for less than $4,000, used removable compact flash cards for image storage, and had all the functions of a traditional film camera. The batteries were removable and rechargeable so that the photographer could carry as many as needed, and the auto-focus and light metering worked well. The camera was not particularly fast in terms of motor drive speed, but it was a huge improvement on previous cameras. It produced a high-quality image file size of 7.5 MB and allowed for automatic and preset custom white balancing for good color quality. This file size equaled a full-frame 35-mm film image scanned to 6.6" × 10" at 200 dpi, which was quite adequate for newspaper use. The camera had a dedicated flash system that worked extremely well as opposed to the previous hybrid cameras, in which you often had to dial down the flash by three or four f-stops to get a remotely decent exposure. Also, the camera was made entirely by Nikon and did not share parts with other companies. At half the price of the Kodak NC2000 with almost none of the drawbacks, this camera became the platform for the current cameras that Nikon and Canon have been refining to this date. The modern age of digital photography had arrived, as had comparable advances in software and computing hardware.

Contemporary Use of Digital Cameras

As I mentioned, the advances in digital cameras have been as rapid as the changes in the computing industry. The early cameras discussed earlier were adequate for the news industry but did not produce the file sizes and image quality that were needed for the commercial and high-end publishing markets. Large-megapixel digital camera backs have been developed for medium-format cameras to meet the needs of this segment of the photography industry. The 2007 introduction of Nikon's and Canon's latest large-file (12.1 and 21.1 megapixel) 35-mm-style cameras has produced cameras that can now be used for almost all aspects of photography. These professional-level digital cameras, like the Nikon D3 or Canon EOS-1D Mark III, are extremely fast. They have no delay problem and can shoot up to 9 and 10 frames per second, respectively.

Canon's latest releases of digital bodies offer two separate professional-level cameras that meet the needs of a wide range of photographers. The Canon EOS-1D Mark III is a high-speed 10 frames per second (fps) 10.1-megapixel camera for the action shooter that still provides the 1.3X multiplier of focal length. In addition, the Canon EOS-1Ds Mark III is a 21.1-megapixel full-frame (1:1 ratio) camera that is capable of shooting 5 fps with extremely high image resolution for magazine and advertising shooters who need the extra file size. On the other hand, Nikon's latest camera, the D3, can shoot full-resolution 12.1-megapixel images at 9 fps while offering other useful options. It allows other shooting modes to give the user plenty of flexibility depending on what he needs at a given shoot. If the situation demands yet faster frame rates than 9 fps, the D3 has a unique 5.1-megapixel DX format mode that boosts the shooting rate to 11 fps by cropping the number of pixels used on the sensor to create the image. Furthermore, this new full-frame camera gives the user yet another format choice with a 5:4 ratio crop mode, which delivers 10-megapixel images up to 9 fps.

The qualities that come with the latest technology are certainly improvements when you compare them to bodies released only a short time ago. I can remember holding out as long as I could to switch from a film to digital camera, because at that time NFL Photos seemed to prefer transparency film images for its clients, and most of the other shooters were still using film bodies. Despite this, during the 2001 NFL season, I finally relented and purchased my first digital body. At that time, it was the latest released camera: the Nikon D1H. This 2.6-megapixel camera offered a file size of 7.5 MB at approximately 4.5 frames per second and a 1.5 multiplier of focal lengths on all lenses without a loss of f-stop, which was a benefit I grew fond of. Although this multiplier can be a drawback when using wide-angle lenses, it also meant that while I was using my 400-mm f/2.8 lens, it was automatically "converted" to a 600-mm f/2.8 lens. This was advantageous while shooting in a dimly lit event or indoor dome game because I usually avoided

using a teleconverter because of the loss of one f-stop. This added focal length for long telephoto lenses is one advantage when shooting sports and going digital, although it's still nice to have a full-frame body for the other wide-lens uses. And while the 4.5 frames per second seemed slow when I compared it to my film body at the time—a Nikon F5, which could shoot almost double at 8 fps—I could already see some major advantages when it came to using digital technology. Fast-forward seven years and several digital camera generations later, and the previously mentioned Nikon D3 and Canon EOS-1D Mark III cameras practically quadruple the effective pixel size, and file sizes have grown from the 7.5 MB that the D1H offered to 28.8 MB for the Mark III and 34.4 MB for the D3.

Today, the majority of sports photographers who are using digital equipment require a laptop computer so they can upload their images immediately, as the photo industry companies normally want the images posted to their Web site for possible sales. The old darkrooms that stadiums used to provide for us have commonly been converted to workrooms for the photographers who need a work area to process and transmit images. Many venues are also providing high-speed data lines so that photographers and editors can send multiple images in a short period of time. Although in some ways the additional time required on the computer editing images is a negative, the speed in which images are handled in today's world is a definite plus. Editors and publications now can view thousands of images in an instant from several wire services and photography-driven Web sites. Newspapers and other publications can use these downloadable images from events all over the world. In short, the use of digital images is faster, far more convenient, and less expensive for publishing than film is.

The Digital Workflow

With the learning curve somewhat established by the early digital news photographers, the race is on to see what the next new software and hardware improvement will be and who will one-up the current line of cameras. I have been an advocate of using a straightforward digital workflow for shooting, acquiring, processing, and delivering my images to my clients. I've stuck with using well-developed imaging software for several years. Of course, this workflow has undergone constant revision to keep up with camera and computer changes.

Certain basic camera settings seem to make a big difference in image quality, so proper camera setup is critical. The first two are the contrast and sharpening settings. Almost every digital camera that I have seen has default settings that work well for the nondiscerning photographer but leave a lot to be desired for high-quality output. Go into your camera menus and turn off or set the image contrast to the lowest setting available. Most digital cameras have a tendency to
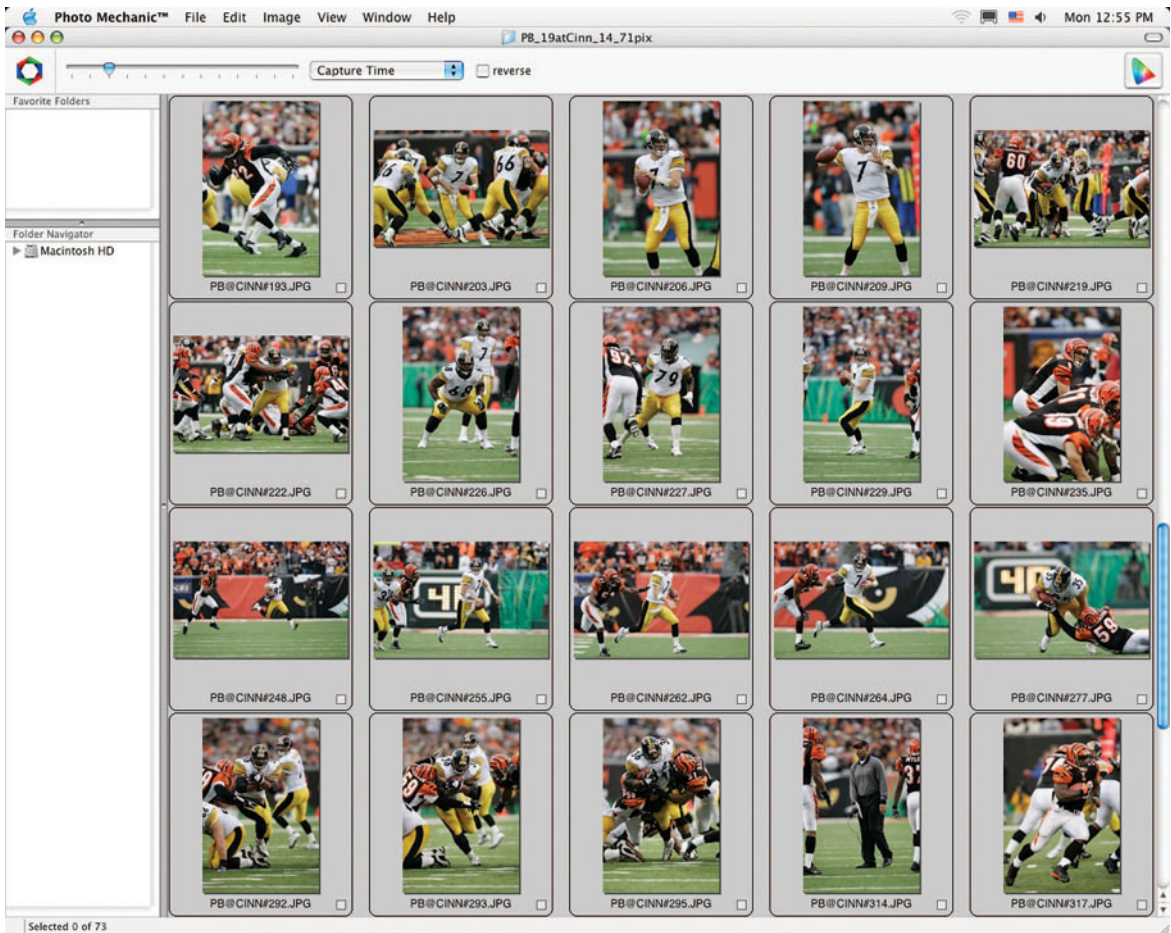
Many sports photographers use browser software such as Photo Mechanic. Illustration images ©G. Newman Lowrance

overexpose the highlights in the image; making the change to the image contrast allows you to retain highlight details.

The default settings for sharpening vary from camera to camera. I experiment with every new camera until I find what looks good without oversharpening the image. It is better to be a little less sharp in the camera and do your sharpening in Photoshop, where you can control the results.

It is also important to set your camera for the AdobeRGB1998 color space because this gives you the widest range of color besides shooting in the RAW mode. Also make sure that your RGB color settings in Photoshop are set to AdobeRGB1998 and that the color profile is embedded in the image file. The RAW mode files are simply raw image captures that are not processed through the internal software of the camera (sharpening, contrast, color balance, and so on) and must be
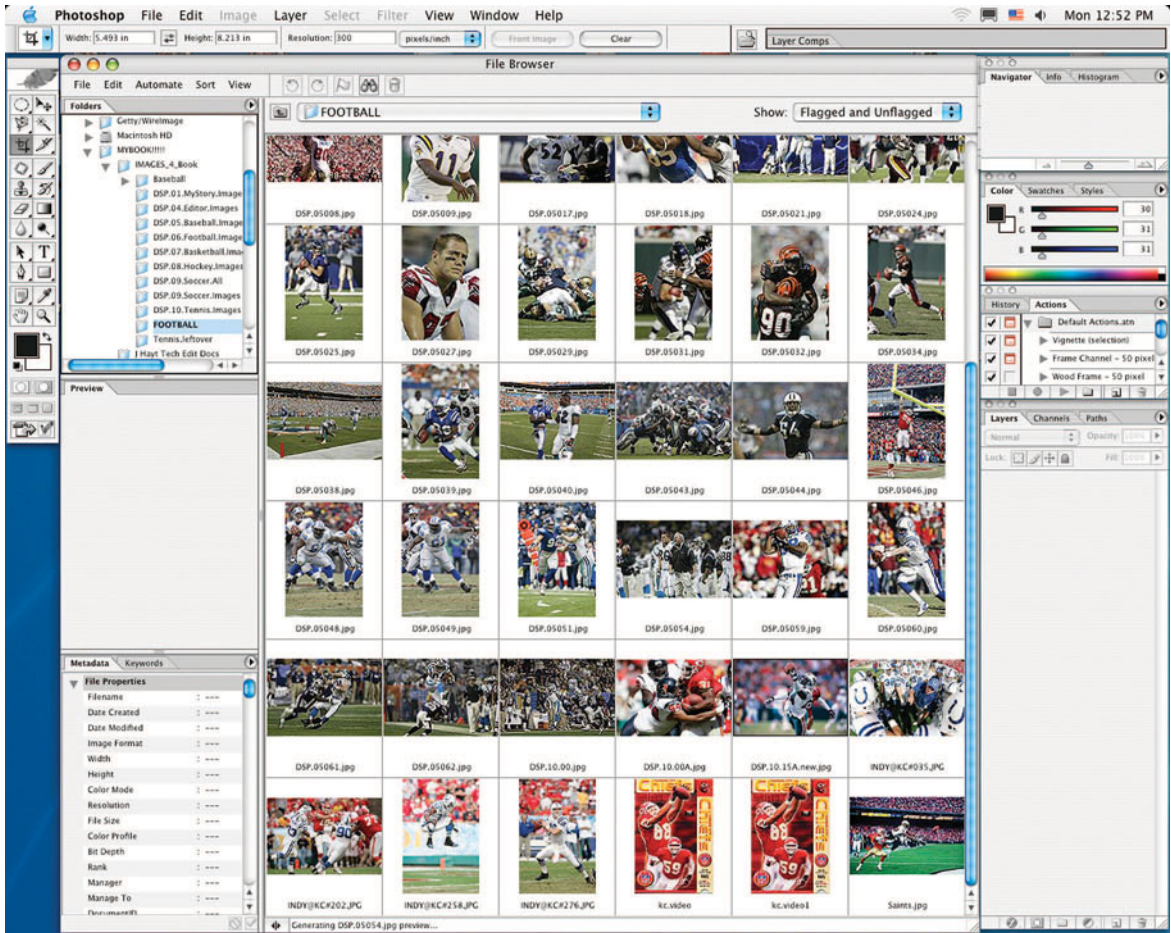
Adobe Photoshop is another popular browser that many sports photographers use.
Illustration images ©G. Newman Lowrance

processed through RAW processing software such as that found in Adobe Photoshop CS and other aftermarket image-processing software.

One last little item is to always make sure that you turn on file number sequencing in the Setup menu so that you don't duplicate file numbers every time you put a new card in the camera. I find that the auto-white balancing works pretty well for most daylight conditions. I always create a preset white balance using a gray card when I shoot indoors under available lighting conditions or when I shoot on a strobe light setup. This really helps to eliminate the weird colorcasts that many modern and not-so-modern indoor light sources create. Most auto-white balancing can't compensate for these mixed light sources, so take the time to learn how to do preset custom white balancing and avoid extra work when you have to process your images.

Most photographers whom I see working in the various media workrooms around the country use similar but minor variations of the same software for image acquiring and processing. I keep my methods simple so that I can repeat them for consistent, mistake-free results. My first step after I have removed a compact flash card from my camera and inserted it into my computer's card reader is to open the disc and view all contents as a list. Canon cameras generate multiple folders on a disc, so you don't want to miss one by viewing it as an icon. After that, I create a folder or set of folders if I want to separate the event by periods and then select and copy each card folder to my desktop folders. When I complete the download, I immediately eject the card and place it back in the camera so that I don't forget to have a card in the camera. I don't reformat the card until I am finished editing and saving my files. I also reformat my compact flash cards in the camera every time I replace them in the camera. Do this with the camera menu settings for a proper reformatting.

After I download my images to the computer desktop, I open them in a photo browser for viewing and editing. I use Photo Mechanic by CameraBits.com, although there are other excellent browsers such as FotoStation, Aperture by Apple, and the browser used in Adobe Photoshop. Photo Mechanic is a stand-alone application that is not very expensive. It allows you to tag photos during an edit and copy them to a new folder that I call my Edit Folder. It also allows you to view photos as enlarged thumbnails or directly in Adobe Photoshop. Any browser that supports your camera file formats and allows easy editing and opening in Photoshop is the way to go.

For the news photographers, it is important that the browser allows you to open the caption file that is attached to the image so that the photo can be tagged with all the necessary caption information. You can also access this through Photoshop, but it is much faster to enter the information through the browser.

After I have finished my editing and sent the select images to my Edit Folder, I open this folder in Photo Mechanic and process each image in Photoshop. When I have finished this task, I apply the appropriate file name to the image and resave it for transmitting or delivery on disc to the client.

It is important to note that not all clients want you to do anything more than a rough edit on your shoot and then send them the untouched files. Many clients have their own settings that they are used to working with, and they do not want you to make changes that they then have to adjust to work with their output needs. Also, more and more clients want you to shoot in the RAW mode and provide them with completely unprocessed digital files. You have to own one of the professional-grade digital cameras to do this because they are designed with the ability to quickly write these large files to disc. I use RAW mode only when image

quality is critical, because there is minimal visual difference between a large, minimally compressed JPEG file and a RAW file, and I can shoot a lot faster and put a lot more images on a compact flash card. Also, don't forget that you need to have Photoshop CS or a RAW file processing software to work with these images.

Technical Lessons of the Digital World

All this new technology has created an innovative way of delivering photos to clients and end users. It is also breeding a generation of shooters who seem to think that imaging software such as Photoshop will allow them to correct their mistakes and make up for sloppy methods behind the camera. This seems to be an attitude that some press photographers developed when they switched to color negative film in the 1980s, when there was a bit more latitude for compensating for poor exposure and bad lighting.

This thinking does not apply to digital photography. You need to approach the world of digital photography as if you were shooting color slide film, with its inherent lack of tolerance for poor exposure and bad lighting. The biggest issue that digital shooters ignore is the need to properly expose and color-balance images, because every correction that you make in the computer means that you have removed or changed some of the original file information, which usually results in a slight loss of quality. After information is removed from a digital image, it cannot be replaced, so shoot as if you were using slide film, and be meticulous in your work habits. The photographers who have been shooting for many years and have experienced the many changes in photography over the past 25–30 years have seen how work in front of the computer has replaced hands-on work in the darkroom.

The new generation of digital shooters is not learning many of the technical lessons that photographers learned using film. The understanding of lighting, exposure, and composition in photography is now often replaced by using auto settings, with little knowledge of the fundamentals of good photographic technique.

Take the time to use your digital camera with strobe lighting setups, and shoot under many different lighting conditions so that you see where the limitations and abilities of digital imaging compare to traditional film photography. The rest of this book is dedicated to providing an overview of the main sports that sports photographers come in contact with. You'll learn particular shooting methods so that you have a better understanding of all the hard-learned lessons that the writers of this book have gained over the past two to three decades of photographing everything that moves.

The Basics of Shooting Sports

Because you're reading this book, you must be interested in learning more about photographing sporting events, whether it is at the youth, college, or professional level. Shooting great action images involves everything from choosing the right photographic equipment to knowing which shutter speed to use. It won't do you any good to have the best equipment out there if you don't know how to use it. Likewise, you can't expect to get the best results if you don't have the proper equipment. The bottom line is that taking good sports photographs still depends on the photographer's skills, despite all the high-tech equipment available in today's digital world. Other important factors that influence your results include understanding the relationship among ISO settings, lens aperture, shutter speeds, and color balance, along with composition and knowing the limits of the equipment you use.

Equipment

The multitude of equipment that you must purchase so that you can photograph sports can be overwhelming. The choices are vast. Besides purchasing the basic digital photography equipment, such as cameras, lenses, and a computer, you need accessories. This section discusses those items that will make your life as a sports photographer easier and help protect your investment.

Camera Bodies

The selection of digital cameras changes practically daily. You don't have the pleasure of purchasing a camera in today's world without knowing its replacement is probably already being designed or manufactured. Because of this, I'm not going to go into great detail about which camera to choose. Your skill level and budget will help you make the best determination for your personal use. However, after you understand some of the basic specifications and what you are getting in a camera, it should be easier for you to make a decision.

If you're like most people, one of your primary concerns is the ultimate sacrifice: how much does it cost? Most professional-level digital cameras currently sell for $4,000 and up, but the next level down from the professional models is much less, in the $1,100 to $1,500 range. Depending on your financial situation, costs might play a role in your camera choice.

Besides cost, some of the main differences between the professional cameras and the semi-professional versions are the number of frames per second that the camera is capable of shooting, the image file size, the auto-focus capability, and the

buffer speed and size. Most of the professional-level bodies provide around 8 to 10 frames per second, whereas the higher-end consumer/low-level professional models are generally in the 3.5 to 5 frames per second range. The professional cameras are also capable of producing larger file sizes while capturing and writing these files to your removable storage (compact flash cards) much faster. In addition, the auto-focus tracking and speed are much faster and more accurate on the professional cameras. It is money well spent if you want to ensure that your equipment is producing the best possible results that your skills allow.

When you're trying to decide on a camera, you need to be aware of several specifications. Two of the more important elements are resolution and frames (or bursts) per second. When you're shooting sports, the faster the bursts, the more images you capture on a given play. This allows you to capture several images to choose from on a given sequence. Out of these images, some will obviously reflect the action better than others, so it's usually an advantage to have a choice. It's easy to visualize the importance of this. If you have a camera that captures eight images per second, versus one that captures four images per second, the faster camera allows you to capture twice as many images in the same time. Now, that doesn't mean you can't capture great images without a high-speed camera, as having great skill with timing and anticipation is the overriding factor. All the famous photographs from the past were captured without these fast burst-rate capabilities. I'm sure the sports photographers from the "old days" would enjoy today's technology, but they were still successful while only shooting one frame at a time. So, while speed helps, don't minimize the importance of your own skills as a photographer.

The other important aspect to understand is the resolution of digital cameras. In terms of the actual image or resolution size, a higher-resolution image generally reproduces better than a lower one depending on the size of the reproduction. Have you ever attempted to make enlargements through an online service or print center, only to see a warning show up to state that the image isn't of sufficient resolution to make the print? This is a good example to give you an idea how resolution influences picture quality. On the other hand, if you're just shooting for your own personal use or don't expect to make huge poster-sized prints or submit images to major publications, then having a more expensive, higher-resolution camera isn't nearly as important.

As previously mentioned, your financial situation might be the biggest influence for your final selection of a digital camera, but you should definitely check out all the camera specifications and make comparisons to several bodies before you decide which one to purchase.
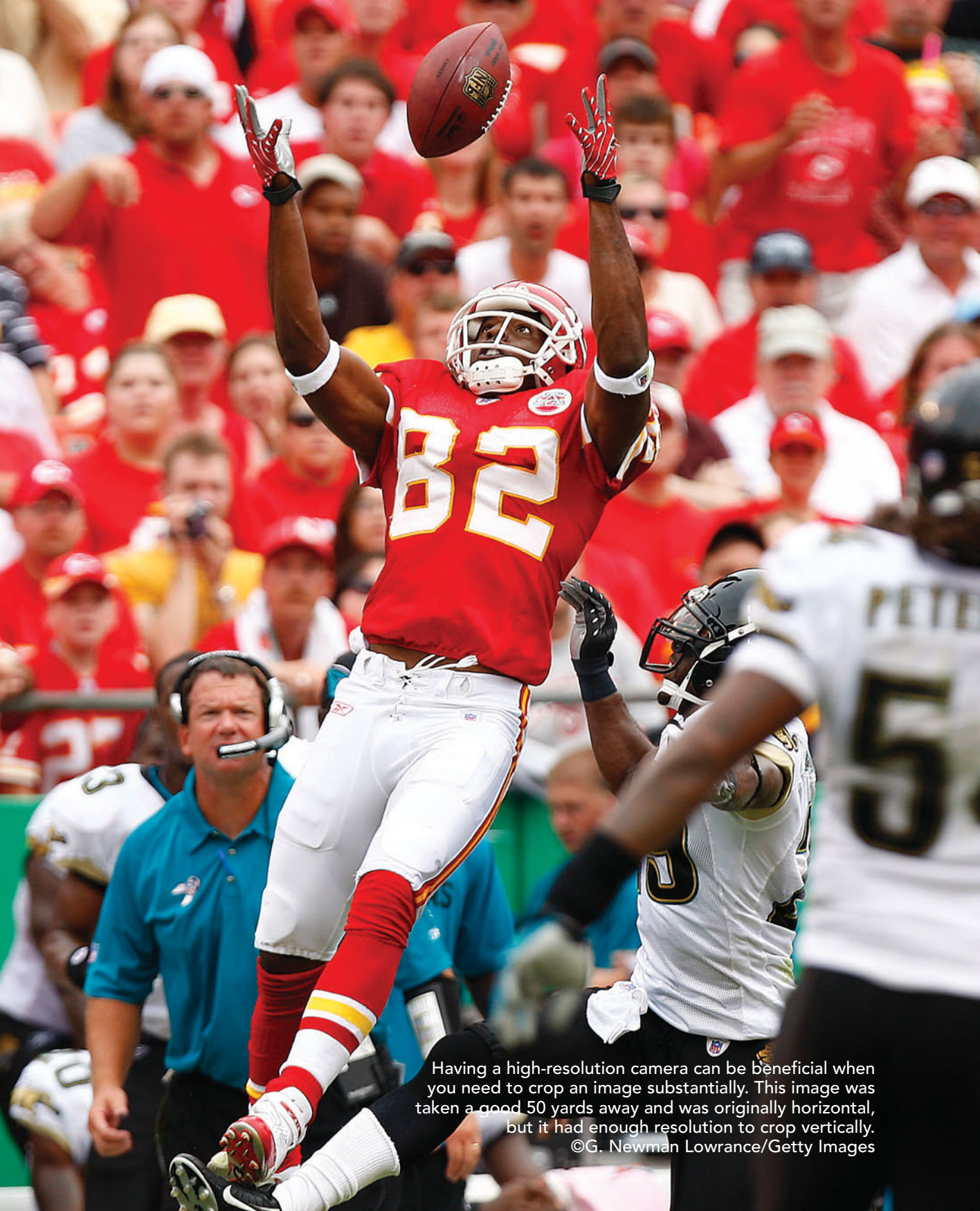
Having a high-resolution camera can be beneficial when you need to crop an image substantially. This image was taken a good 50 yards away and was originally horizontal, but it had enough resolution to crop vertically.
©G. Newman Lowrance/Getty Images

Camera Basics

Even though most of the newer digital and so-called "automatic" cameras today don't require you to set the aperture and shutter speeds, you still need to understand what these settings do so that you can shoot quality photographs. I generally photograph using manual exposures anyway, at least when the lighting allows, because a basic light meter reading can often provide better overall exposures than letting the camera decide them for you. Even though this practice isn't as frequent in today's digital world, which leads to some post-production modifications to your images with software programs such as Photoshop, I find a reassurance in using manual settings.

In the days of shooting with transparency film, you needed to be dead-on with your exposures, or your images would be under- or overexposed. Just remember that shooting digital photography requires the same level of precise exposures as shooting transparency film. There is no leeway here, and the idea of fixing something like this in Photoshop is one of digital photography's great fallacies. Every adjustment that you make to an image in Photoshop creates a change in the pixel structure and content of the original image. As you make changes, you remove information, and this information is never replaced.

The best quality that you can obtain in digital photography is through proper and exacting exposures when the image is shot and not in post-production image processing. This is another reason that I still use a light meter to this day. I do, however, use the automatic features if I'm on a field that is half-shaded, or when I'm shooting at an event when the clouds are moving in and out of the sun's light rays and changing the exposure from moment to moment. In today's sports photography world, many shooters use these automatic features exclusively, although they might "tweak," or compensate their exposures using the camera's features to do so. An example of this might be to add plus 1/3 or plus 2/3 of an f-stop to an automatic exposure setting to gain some detail in an image that otherwise might be underexposed using the camera's automatic features. This is especially true when you photograph teams or players wearing all-white uniforms, which is somewhat common. The camera's automatic metering system will "read" all the white and react like there's more light than there really is. Although the uniforms will probably be exposed properly, getting good face details might be harder if players are wearing helmets or caps, as their faces will undoubtedly be underexposed when you're shooting automatically without any compensation to the exposure.

Aperture

The aperture and shutter speed settings work together to control your exposures for a given image. The *aperture* is basically the opening and closing of your lens iris diaphragm, which changes in size and allows more or less light to enter through the lens depending on your setting. It's similar to the way your eyes change as you leave a dark setting and walk into the bright sun. The iris in your eyes gets smaller to allow less light, and it gets bigger to allow more light. Aperture in a lens works the same way. These aperture control features are called *f-stops.* They are usually found embossed into your len's rear ring near the camera mount. These f-stops usually are listed on your lens (f/22, f/16, f/11, f/8, f/5.6, f/4, and f/2.8). The best way to remember how it works is this: the bigger the f-stop number, the smaller the opening that your lens allows light to pass through. In addition, each higher number lets in half as much light as one number lower. For example, an f/4 setting allows twice as much light as an f/5.6 setting, whereas an f/8 setting lets in only half as much as f/5.6. Most digital cameras allow you to set either 1/3 of 1/2 f-stop increments electronically in the camera for finer adjustments of exposure. Remember, however, that these aperture settings need to correlate with your shutter speed so that you obtain a proper exposure. Here's an easy way to remember your depth of field control: the higher the number, such as f/11, the greater the depth of field. A lower number, such as f/2.8, allow less depth of field.

For an elementary look at how aperture controls your final image output, I'll use my boys Jordan and Austin as examples. These images were taken with a 70–200-mm zoom lens, so it's easy to distinguish the depth of field using a high and then low aperture. I shot Figure A with an aperture of f/2.8 and a shutter speed of 1/2000 of a second. Notice how only the main subject of my focus, Austin, is in focus, while everything behind him is blurred. Now notice Figure B. I shot this image with an aperture of f/11. You can easily see the difference between the two figures. With Figure B, Jordan and practically everything else in the image are in focus. Also notice that with a shutter speed of 200, you see a little blurring with Jordan's hands.

Many professional sports shooters today like to use an automatic aperture priority setting so they can control the aperture to a predetermined f-stop. Shooting in this manner will keep all your images at that aperture setting and allow the shutter speed, which is dependent on the lighting of each captured image, to "float." Just be aware of what your shutter speed will be at the worst lighting situation so you don't show too much motion in your images. For most scenarios, you will want to shoot with a small depth of field, typically around f/4 for day shooting and "wide open" for night events at f/2.8. This will help keep your shutter speeds fast and give your background elements a softer appearance to make your main subjects stand out better.

Figure A. ©G. Newman Lowrance

Figure B. ©G. Newman Lowrance

Shutter Speed

The shutter speed controls the amount of time that light is allowed to expose the image. The shutter opens and closes at varying speeds to determine this amount of time that the light entering the aperture is allowed to provide the exposure of the resulting image. Shutter speeds on cameras are measured in fractions of a second. A 500 setting means 1/500 of a second, a 250 setting means 1/250, and so on. Most professional digital cameras today provide shutter speeds ranging anywhere from 30 seconds to 1/16,000. A shutter speed setting for a bright, sunny day, using an aperture of f/4 and an ISO rating of 100, might be 1/1000 of a second or even faster if you are shooting a subject that is frontlit. A cloudy day might use 1/500 of a second with the same f/4 aperture and ISO settings of 200 or 400, exposing to allow light for a longer period. Of course, you need to know what your settings should be to get a good exposure. You can do this by using a light meter as previously discussed, or by using your automatic exposure and

built-in light meter features in your camera. Also, knowing what you want your final result to be dictates your choices on exposure, whether you want to freeze the action with a fast shutter speed or control your depth of field with the aperture. Whatever the circumstance, the light readings that you obtain offer many choices for choosing your exposure.

Because the shutter and aperture settings approximately halve or double the light reaching the final exposure with each change in setting, you can use different combinations of settings to create a good exposure. For example, perhaps you take a light meter reading that reflects a 1/1000 of a second shutter speed with an f/4 aperture setting at ISO 100. You could also shoot this at f/5.6 and 1/500 of a second. Besides shooting this second exposure at half the shutter speed, you also gain one f-stop for more depth of field with the f/5.6 setting. Just remember that the benefit of additional depth of field, which gives you a greater depth of focus, is almost irrelevant when using a lens that has a focal length longer than 180 mm. As I mentioned, most sports photography is done with long telephoto lenses, and shooting with a minimal depth of field keeps your backgrounds out of focus and helps isolate your subject from the background, thus making a visually stronger photo. If you look at the depth of field hash marks on telephoto lenses, you'll see almost no real gain in depth of field from f/4.0 to f/16. Always opt for a higher shutter speed with a large aperture, because this freezes the action and increases image sharpness. I have seen lots of great action shots that are lost to motion blur due to slow shutter speeds, so avoid them unless you intentionally want this effect. Intentionally shooting with slow shutter speeds can bring some unique results and can be a fun way to experiment when you are in dimly lit environments.

If each of the earlier mentioned examples provided a good exposure, you might ask why a certain exposure really matters. Basically, it comes down to what is more important to you: the depth of field controlled by the aperture, or the shutter speed that will freeze the action. Here is where the correlation between aperture and shutter speeds can get confusing. Along the same lines that f/4 is one stop different from f/5.6, most cameras allow for 1/2 and 1/3 stops between the full f-stops. For example, from f/4 to f/4.5 is 1/3 of a stop. From f/4 to f/5 is 2/3 of a stop, and from f/4 to f/5.6 is one full f-stop. You can use these intermediate f-stops to have full and accurate control of your settings. By changing your camera settings to move in these increments of 1/3 of a stop versus full f-stops, you give yourself more options for different exposures. Using this scenario, you would get the same overall exposure by shooting at f/4 with a shutter of 1/1000 as you would using an f/4.5 aperture with a shutter speed of 1/800. Even though you are changing the increments of the exposure, you will be obtaining the same equivalent exposure, but with a 1/3 slower shutter and a 1/3 smaller aperture.

Here's an example of blurring caused by a shutter speed that is too slow. I intentionally shot this play at 1/60 of a second hoping for something dramatic to happen. Even though there's nothing special about this image in particular, slow shutter speeds can give you some interesting-looking images. ©G. Newman Lowrance

Although you should now understand the relationship between aperture and shutter speeds, you should also comprehend the reason for using a large aperture opening (such as f/2.8, f/3.2, f/3.5, or f/4) and fast shutter speeds to obtain quality sports images. Bear in mind that the sport and level you are shooting will be a big factor in determining which shutter speed to use. By shooting with a fast shutter speed to stop the action in conjunction with a large aperture, you will be able to keep the separation between your subjects and background obvious, and obtain better results.

Another option to control your shutter speed is to use the shutter-priority mode, which is different from using an aperture priority mode. Using this mode allows you to preset the desired shutter speed, while allowing the camera to set the aperture automatically to obtain a proper exposure. Just be sure your ISO speed isn't set too high, as that will lead to a smaller aperture with perhaps too much depth of field. This result will lessen the separation that we discussed.

ISO

Understanding how to achieve your exposure settings using the aperture and shutter speed controls is dictated by and related to your "film" speed, otherwise known as your ISO rating. The *ISO rating* is a numerical rating that describes the light sensitivity of your "film," or in the case of digital cameras, the ability of the sensor chip to acquire an image at a corresponding rated exposure.

Previously, if you were using film, you needed to change the film cartridge to a higher ISO film or "push" your film during processing so that it was rated at a higher ISO. With digital cameras, the ISO rating is incorporated into a simple change to your camera settings. Thus, if you feel your shutter speeds are getting too slow, such as when an afternoon day game turns into a night event, the alternative is to change your ISO rating. Usually ISO ratings range from ISO 100 to ISO 1600. If you recall purchasing film in the old days, you had choices of ISO 100, 200, or 400 for most consumer negative films. Sports photographers usually used transparency (slide) film of the same ISO ratings or purchased ISO 800 color negative film and pushed it one full f-stop to ISO 1600, or perhaps even another 1/3 f-stop to ISO 2000 when the additional speed was required indoors or at night. The main difference in these ISO settings is what is commonly referred to as *grain* or *noise* in the digital world. For example, an ISO setting of 100 has almost no noticeable noise, but if you compare that to an image with an ISO setting of 3200, you will notice the difference in noise that this higher setting shows in the grain structure of the image. The positive in the newer technology is this grain structure continues to become less noticeable as the newer digital cameras are continually providing less noise at higher ISO settings, so you might not notice a huge difference unless you enlarge an image a large amount. Another difference when using higher ISO ratings is the image file size when using a digital body. A higher ISO rating reduces the number of images that a memory card can store. This is another reason why having fast lenses with an f/2.8 opening is an advantage. Shooting a night event with a lens that opens only to f/4 or f/4.5 requires you to use an extremely high ISO setting with a slower shutter speed. The result is that your images show more noise than when you use the faster lens. Of course, if you are shooting mostly youth sporting events or events played during the day, using the slower lens is an adequate and less expensive option. For an example of noise using diverse settings, notice the following images. Figure C has an ISO setting of 200, whereas Figure D has an ISO setting of 1600. You wouldn't notice the difference so much if the image were published small; however, after zooming in close, you should be able to see a slight difference in the grain in Figure C enlarged versus Figure D enlarged.

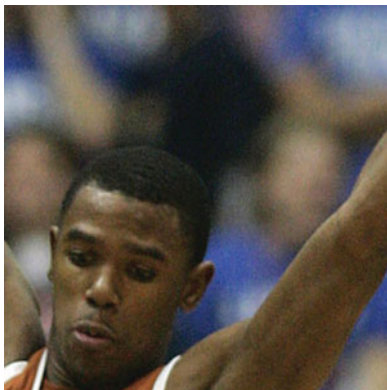Figure C enlarged.

Figure C. ©G. Newman Lowrance

Figure D enlarged.

Figure D. ©G. Newman Lowrance

White Balance

Most people fail to realize that photography is all about light, color quality, and accuracy. Most light sources are not a pure white anyway, but maintain a certain *color temperature* that is measured in degrees Kelvin. Typical light-source color temperatures range from warm to cool, as follows:

Incandescent	2500 K–3500 K
Twilight	4000 K
Fluorescent	4000 K–4800 K
Sunlight	4800 K–5400 K
Cloudy daylight	5400 K–6200 K
Shade	6200 K–7800 K

How often have you taken a photo under household lighting conditions such as using a floor lamp with an incandescent bulb and had a nice orange cast to your photo? As seen in the previous chart, an incandescent light source has a typical color temperature of around 3200 K. As color temperature rises, the color gets bluer and cooler until it becomes almost grayish blue, as seen in deep shade or low light. The most natural and sought-after color temperature is basic daylight, which is around 5400 K. This renders the most natural skin tones and reproduces the most accurate colors. In the past, color film was offered in only three color balance types: daylight balanced transparency, tungsten (incandescent) balanced transparency, and color negative. Color negative had the advantage of allowing color correction at the time of printing through the use of light-balancing filters to give accurate color. Digital cameras allow for an almost infinite ability to adjust for the color temperature of any given light source through preset or custom white/gray-balance settings. This is a huge benefit to sports photographers who shoot under a myriad of lighting conditions.

The white-balance feature in digital cameras attempts to calculate these temperatures to reflect a faithful color rendition of your images. Most digital cameras allow you to choose from several different preset white balances, such as sunny, shaded, cloudy, tungsten, fluorescent, flash, and automatic white balance, which is otherwise known as AWB. Additionally, most camera menus allow you to apply a "custom white balance," which occurs when you photograph a white object (I have often used a person's white T-shirt or white uniform if I didn't have a white or gray card available) that serves as the standard for the white balance, or use a gray card to get accurate measures of the color temperature.

I cannot stress enough the importance of learning how to accurately white-balance your images for any given lighting that you might shoot under. Daylight is pretty simple because the built-in camera settings work well, as does the AWB setting. This also usually works well if you have to go from sun to shade during a play and can't do a manual adjustment quickly enough. When shooting indoors or at night under the available lighting, it is worth the extra few minutes it takes to perform and set a "custom white balance." I do this under all artificial lighting and when using strobes, because it removes color casts that the camera presets can't handle. Read your camera's instruction manual and learn how to do this, because it dramatically improves the color of your images and saves a huge amount of post-production cleanup on your images.

Careful and proper white balancing is a new added dimension of digital photography. Treat it with the same diligence as your exposure settings. Don't be lethargic and rely on your camera to do all the thinking. Learn how to do these custom setups, and you will see a big difference in your image quality, especially when shooting under poor lighting conditions.

As photographers have converted from film format to the digital world, the general feelings about color temperature from the conventional manner have changed. Previously, most of us weren't that concerned with the color temperature when we used the conventional methods. Today, however, being unaware of this aspect of photography is no longer acceptable. Although we might go to great pains and still not get an exact color with digital format cameras, getting close is now a probability and a high priority.

Color Space and Camera Settings

When you first start going through all the menu options in your new digital camera, you come across many options that ask you to make choices that are completely foreign to the traditional film photographer. The first that you usually encounter is a choice of color space settings, which include AdobeRGB1998 and sRGB IEC61966-2.1. This is one of those moments in which most photographers scratch their heads and leave the camera on the factory default setting, which is usually the sRGB color space. Each one of these color space designations represents an important aspect of how your camera captures and provides color information that is an embedded part of the digital image's information. The color space describes the range of colors in the visible spectrum that is captured by the camera and made available and embedded in the digital file of the image.

Different color spaces were originally developed to match many different output devices, such as printing presses and other devices that output color photos and printed materials. Many devices can handle only a limited range of color and

simply discard or clip colors that aren't within the range of the equipment. The sRGB color space was designed as a more limited range (gamut) of color to meet the needs of the printing industry. In recent years, developers have created inkjet and other multi-ink printers that can handle a much wider range of colors.

A wider-gamut color space, AdobeRGB1998 was developed by Adobe Systems, Inc., as part of its imaging software. The AdobeRGB1998 color space contains much more color information than sRGB and should be used as a general setting for most of your digital photography. The only time that I use the sRGB setting is when I know I will be printing my photos on a printer that can only handle this limited color space. It is always better to have to convert colors to a narrower color gamut and throw away digital information than to have to make a limited range of colors work in a wide-gamut color environment, such as a new high-end printer.

This is also a good time to mention a few words about color management. Color management is another one of those areas of digital photography that sounds much more mysterious than it really is. *Color management* is just what it sounds like: it is the process of communicating color information that was originally captured in your digital image so that other devices, such as computers and printers, can understand it. Simply put, it allows other devices that might not work well with your original color space to translate or understand the color in your image.

Remember what was previously discussed regarding printers that cannot use all the color information contained in the AdobeRGB1998 color space? What typically happens is that a printer manufacturer creates what is called a *color profile*, which is simply the range of colors that the manufacturer equipment can handle and output.

This color profile describes the range of color that the equipment can use and acts as a translator that takes your original color space information, such as AdobeRGB1998, and converts it to the colors that the printer can use. Basically, this is like taking a word in English and translating it into Spanish so that it has the same meaning but can be understood by a non-English speaker. This is a simplistic explanation, but it gives the idea that there needs to be a means for one device to communicate with another in a translatable language.

The big difference here is that there is also a conversion of the color information from one profile to the next, as each profile describes a specific set or range of colors and thus makes a conversion of the original color information to work with the particular piece of equipment. This just means, for example, that a particular shade of red described by AdobeRGB1998 might take on a new name in sRGB, but it still appears to the eye as the same shade of red and prints out as

the same color. Just remember to always retain the color space as an embedded color profile in your image so that the colors are interpreted properly from one device to another. If you discard or don't apply a color space to an image, no one knows what your original colors were. You let another device or person decide what they should be. This is similar to shooting a negative image and letting the printer decide what the color should be.

The next item that often ends up confusing most new digital photographers is the issue of "sharpening" your digital images. Almost all digital cameras allow the user to set the level of in-camera sharpening from "off" to "more sharpening."

I try to do as little image processing in the camera's built-in software as possible. There is much more accuracy and control of digital image processing in Photoshop than there is in the 35-mm format digital cameras. I either turn off the sharpening completely or leave it on its lowest setting. You can always do a series of tests with a new camera to see which looks best along with applying your normal sharpening in Photoshop. Remember that if you sharpen an image that is going to be used in a publication, the printer almost always adds some sharpening as part of the pre-press process. This can really add a pixellized or oversharpened look to an image that looked fine when it came out of the camera, so be careful about applying sharpening in the camera or even during post-production processing. Always check with your printer or publisher to determine how it wants the images to be processed.

The other, and probably most significant, adjustment in the camera software is the contrast range setting. I always turn this off or set it to the lowest possible setting that the camera allows. This is the single biggest image destroyer in your camera's arsenal of imaging software. Turn it off, and you will see a huge difference in the quality of your image highlights and noise reduction in the overall image.

Always apply contrast and sharpening in image post-production processing, because it is easy to add contrast and sharpening if an image needs it. Shoot a player in a white uniform, and look at the image with and without the contrast setting. You will see a significant change in the detail quality of the photo. I have seen way too many digital photos that have absolutely no detail in the highlights, and this is inevitably caused by this one little camera function.

The last camera function that is worth mentioning is the setting of sequential file numbering in your camera menu settings. This allows the camera to write a continuous sequence of file numbers up to a certain limit (usually 10,000) before it reverts back to 1 again. This feature enables you to download images to your computer into a single folder so that you can sequentially arrange the photos for easy editing and retrieval.

Lens Selection

Most likely, you will have a camera that uses interchangeable lenses. You will have many choices in terms of lens selection. The main difference in lenses is their focal length. Focal length controls the magnification, or the size of the image, in addition to the angle of view.

The digital age has changed these specifications somewhat. Regardless of what brand you select, most digital cameras have a magnification ratio, which makes your lens automatically "longer." Because Nikon and Canon cameras are widely used in the sports photography world, I'll use them as examples. The Nikon D1, D1H, and D2H cameras all provide a magnification ratio of 1.5 to 1. The Nikon D2X has two modes that give the user a choice of the magnification ratio. The recently released Nikon D3 also provides a 1.5 ratio when used in DX format. This basically means that a 300-mm lens is now a 450-mm lens. Similarly, a Canon EOS-1D Mark II or Mark III camera body provides a 1.3 ratio so that a 300-mm lens actually provides you with a 390-mm lens.

The other important fact to note is that this magnification ratio does not change your lens opening or aperture settings. Thus, a 300-mm lens that has a magnified focal length on a digital body still has the original lens aperture. This factor might alter your original decision on which lens to choose if you were previously shooting with a film-format camera. You might not need a long telephoto lens such as a 500 mm or 600 mm, because the magnification and the use of a tele-converter can provide the same basic focal length as an additional lens.

Wide-Angle Lenses

Besides having a long telephoto or long zoom lens to photograph the various sports, you might consider adding a wide-angle such as a 20-mm or even a "fish-eye" lens to your arsenal. These lenses are excellent when you want to obtain an overall shot, such as a view of an entire stadium, or a group shot of an entire team. Although you might not use this lens when shooting the actual game action, the uses that you gain with these types of lenses allow you the freedom to get many different looks while shooting the event.

Because the advent of the digital cameras includes the magnification ratio that I spoke of earlier, these wide lenses aren't as wide as conventional, or film-format, cameras, but you will still find many uses for them. You can also consider a wide-angle zoom lens, such as a 20–35 mm, 16–35 mm, or 17–40 mm instead of using a fixed-focal-length wide-angle. The advantage of these lenses is the range they offer when composing an image. The speed of the lens usually dictates the cost. Faster lenses with larger apertures are always more expensive.

Telephoto Zoom Lenses

Numerous telephoto zoom lenses are available to choose from. Many sports photographers carry a 70–200-mm f/2.8 zoom lens for relatively close action. This type of lens comes in handy during a football or soccer event, when the teams get close to a scoring opportunity. While you are 20 or 30 yards away from the action, these lenses work well to get you close enough to the action, but not too tight, like a 400-mm might be under the same conditions.

These lenses are also excellent for obtaining vertical portrait shots of the athletes prior to a game. Again, they give you enough freedom to compose your image so that you don't have to move closer or farther away, like you would if you were using a fixed-focal-length lens.

When choosing these types of lenses, or any lens for that matter, consider the speed of the lens. The f/2.8 openings that are available for some of these lenses allow you to shoot night events or give you a better range in which to work with your exposures and keep your shutter speeds relatively high. They are also offered with f/4.0 and f/4.5 and as high as f/5.6. However, keep in mind the restrictions you will be putting on yourself relative to your shutter speeds in low-light conditions.

Telephoto Lenses and Extenders

Long telephoto lenses—such as 300-mm f/2.8; 400-mm f/2.8, 500-mm f/4, and 600-mm f/4—are practically required for photographing professional sporting events. The reason for this is quite simple: you typically are far away from the action, and you need to bring the action closer to you.

The most frequently used lens in field-event sports is the 400-mm f/2.8 lens. A new Nikon or Canon lens of this length could cost you $6,500 or more. An alternative is to purchase a less expensive 300-mm f/2.8 lens and add a 1.4X or 2X teleconverter. This option is significantly less expensive and allows you to have the relatively same focal length as purchasing a 400-mm f/2.8 lens. The only downside of this method is that you lose one f-stop when using the 1.4X extender, or two f-stops if you use a 2X converter.

I don't recommend using a 2X converter, because you tend to lose a lot of sharpness in your images, and it slows down the tracking of the auto-focus mechanism in the camera. The 1.4X is not as severe in this situation and is fairly common in the industry. I do, however, recommend purchasing the same brand converter as your lens. They might be higher in price, but you will definitely notice the difference in sharpness and auto-focus speed.

Wide-angle and "fish-eye" lenses
are excellent for stadium views.
©G. Newman Lowrance

A wide lens is also useful for capturing large group shots. ©G. Newman Lowrance

Using a zoom lens such as a 70–200 is a great way to photograph basketball to capture scoring opportunities, or as a remote camera behind home plate for baseball. ©G. Newman Lowrance

A 70–200 zoom is also a great lens for many football situations when the teams get close to the end zone or score a touchdown. ©G. Newman Lowrance/WireImage

Here, my positioning is from the back of the end zone, a good 50 yards from the action. However, with a 400-mm f/2.8 and added teleconverter, I am still close enough to capture a worthwhile image, even without cropping.
©G. Newman Lowrance

Although these usages might prohibit you from using the shutter speed that you want for a night event, for most day events, it is a viable option. You can always take off the teleconverter and go back to the faster f/2.8 opening of your lens. Another advantage of purchasing the 300-mm f/2.8 versus a 400-mm f/2.8 lens is the size and weight factor. The 300-mm f/2.8 lens is much easier to carry around while you are shooting your event.

Since the magnification of the digital camera bodies has come into play, the use of these longer lenses, such as the 500-mm f/4 and 600-mm f/4, is not as important as it was in the past. Before the digital age, when a photographer used, for example, a 600-mm f/4 lens, the lens was just that: a lens with a focal length of 600 mm. But now with the magnification that a digital camera provides, a 600-mm f/4 on a Nikon digital camera body can actually become a 900-mm f/4! Similarly, the Canon 600-mm f/4 lens is a 780-mm f/4. By using these focal lengths, your angle of view is significantly limited; however, if you are in the back of an end zone with the action 70 or 80 yards away, having these extremely long lenses is an advantage. A drawback to these long lenses occurs if you notice heat waves in your viewfinder. Using a teleconverter also increases this possibility. You can usually see the heat waves in your viewfinder while you are photographing.

A 300-mm f/2.8 lens (far left) is much smaller and lighter than a 400-mm f/2.8 or 600-mm f/4 lens. The yellow tape you see added to the lenses protects them from minor dings.
©G. Newman Lowrance

Accessories

Besides the basic camera bodies and lenses required to photograph sporting events, many accessories are considered necessities in the field. The list of accessories is extensive, but this section covers the basic must-have items.

Monopods

You won't find many sports photographers trying to hand-hold a 400-mm f/2.8 lens on a camera body to capture a picture. If you've noticed how much gear the professionals carry for a typical event, you've surely seen how they mount their long telephoto lens on what is called a *monopod*. Similar to a tripod except with one leg instead of three, the monopod is a must-have in the sports photographer's line of equipment. Besides, tripods are not allowed on the sidelines of most professional and college sports events. They are a danger to the players and photographers because of their lack of mobility.

As with most other equipment, monopods come in many brands and styles. Typically, they have a limit on how much weight they can hold. They can come in three or four sections, which reduces their size when not in use.

Some monopods are available in carbon fiber, which is lighter in weight but just as strong as aluminum or alloy versions. Also, during cold days, the carbon fiber types don't feel as cold as the traditional alloy monopods. The downside is the cost, because the carbon fiber monopods are much more expensive.

Regardless of the material, I prefer the four-section types that, when broken down, are not as long and fit in a carry-on bag to take on an airplane. Of course, with the security measures that airlines now employ, you might not be allowed to bring one on board. So far, this hasn't been a problem for me.

Waist Bags

Another handy item, the waist bag, is great for holding all your small items that you typically use while shooting sports, including memory cards, teleconverters, filters, small lenses, light meters, and the like. You can choose from many different sizes, brands, colors, and materials. If you prefer, you can wear a belt pack to carry several small lenses and perhaps a water bottle, and use a bag for the other accessories I mentioned. I typically use a waist bag that's large enough to carry a fish-eye and a wide-angle lens in addition to extra batteries and anything else you might need at a game, such as a cell phone or compact radio so that you can listen to the game as you shoot if you desire.

A roller case to hold a long telephoto lens, camera bodies, and smaller accessories is a must-have for the professional sports photographer. This case is small enough to carry onto an airplane, which makes it extremely handy. ©G. Newman Lowrance

A waist bag is a great way to hold many small items that you will need during an event. ©G. Newman Lowrance

Carrying Cases

Another must-have is a case to hold your camera bodies and at least one long telephoto lens with enough room for your smaller accessories. Most of these cases are offered as a backpack or as a roller case, which is extremely convenient for all aspects of traveling with your gear, regardless of whether you are getting on an airplane or just driving to an event. I like to carry my expensive items on board when I'm flying, because I've heard too many stories about equipment being damaged, lost, or even stolen.

Caring for Your Equipment

Photographers often take this subject for granted, but it's important to take good care of all your photography equipment. You can spend a small fortune to set yourself up to photograph sporting events, so you need to properly maintain your equipment. The better you take care of your equipment, the better it will work. If you constantly bang your lenses around and drop your gear instead of placing it down softly, you will notice the eventual wear and possibly the function of the gear. This also lowers your resale value, as you will find out when you want to upgrade your gear. Remember never to carry a camera with a long

telephoto lens by the camera body, because this stresses the lens mount and can easily throw off the collimation (the alignment of the optics) of the lens and the body and cause focus problems. Camera body lens mounts are not designed to take much weight, so always carry the camera by the lens.

It's also good to carry a lens cleaner with you whenever you go to an event. If you didn't take the time to clean your gear previously while you were packing up, you should at least wipe all your lenses as you are setting up to remove any dust particles that might show up in your final output.

Another good investment is that of an ultraviolet or skylight filter for each of your lenses. These filters not only protect the actual glass of the lens, but also eliminate ultraviolet that the eye does not see. Using these filters protects your glass and might even prevent a lens replacement if you happen to drop or bang your lens into something. If you are not a big fan of lens filters, always use a lens hood that is properly designed for your particular lens. A lens hood really helps to protect a lens from scratches and impact damage.

When you aren't actually at the event, always replace the front and rear caps of each lens and the body cap of your camera. If you don't, dust could enter your gear and cause spots on your images.

A big word of caution should also follow in the cleaning of the sensor chip in your digital camera. These chips are extremely fragile and susceptible to scratches and damage. Only a factory-authorized repair service or a cleaning system that is specifically designed for this application should clean them. Several products on the market are designed for this, but use them with the utmost care. Don't use traditional lens cleaner fluid or tissues, and avoid canned air products. After a chip has a blemish, the flaw is noticeable on images that are shot with any amount of depth of field. Be careful.

In closing, take care of your equipment, keep it clean and dry, and you will get many years of good use from it. Photography equipment is rugged only to a certain degree. You need to treat it like the delicate computer that it is.

What an Editor Looks For

by Kevin Terrell

CHAPTER

4

I am blessed to have been the managing photo editor and a staff photographer for the National Football League (NFL) for more than 13 years. I loved every day, hour, minute, and second of my job. Editing photos is an exercise of admiration and critique. When I was editing, I was not only admiring the body of work I was examining, but also being critical in deciding whether to retain an image. An editor needs a thorough knowledge of what he's looking at and the discretion of knowing what to keep and why. During the time that I edited for the NFL, several of our photographers, regardless of how long they had been shooting professional sports, asked me, "What do you look for when you're editing?"

The answer to that question is broad and somewhat complex. As an editor, I considered many things as I was choosing an image: the appearance of the subject(s), the sharpness of the image, the clarity, the contrast, the composition, and the image's ability to be cropped to fit a layout for a publication.

Although no two editors are alike and we don't always see the same thing when observing a photo, we do look for some similar qualities. Those editors who are liberal in their selections usually pull heavily or choose to keep many images from each contributor. In giving some slack to the shooters, they reason that quantity often generates quality. At times it does, but it also leads to retention of imagery that might never be used. It means extra storage space that can overpopulate an agency's or wire service's Web site with mediocre material.

Others editors are more selective and somewhat stricter in their editing and choose only the best of each take. When looking through a sequence of images, they might select the best two or three images, as opposed to a liberal selector, who might opt to keep the entire sequence.

Both styles of selection have advantages and disadvantages. For instance, as I said before, the liberal editors will likely end up keeping many mediocre images that might never see the light of day. This also increases the number of photos that an editor would have to look through when researching specific images. The more images you keep, the more you have at your disposal and have to wade through when trying to find the perfect shot(s).

If an editor is lean in his editing and only keeps the primo material, he runs the risk of deleting or returning material that he could end up needing later. You never know what a story editor is going to ask for from a game.

(a)   (b)

Here are two examples of liberal editing. There's no special action occurring in either of these photos, but both made the cut because Peyton Manning (a) looks as though he is exerting a lot of effort and Priest Holmes (b) has a shadow in the foreground that makes him stand out.
©Kevin Terrell/NFLP

Good editors might not remember everything they see, but they should be able to recall whether they've seen something when someone asks them for a particular image. There's no worse feeling than being asked for an archived image that you're not sure if you've returned or deleted, especially when you're on deadline. Sure, you can go back and ask a photographer to resubmit it, but if the photographer didn't happen to keep the image on file or sent it to another publication or stock agency, you might have some explaining to do.

Editorial Use

What a photo editor pulls and why is usually determined by what the images will be used for. For example, when we're selecting images for an editorial use—a newspaper, magazine, or online publication—we usually keep an eye out for photos that will best tell a story. Editors need photos that vividly display what the author is reporting on or the subject/theme that is conveyed in the text.

When submitting a series of shots of the same play, don't be disappointed if an editor doesn't retain the entire sequence. Their selection really depends on what is occurring on the play. In this sequence, I would keep the second and maybe the third photos of this group, but not all four.
©Kevin Terrell/WireImage.com

When I was editing and selecting images for editorial use for an NFL publication, I was generally given more freedom to submit images that weren't the generic action shot. The managing editor and editor in chief of an NFL publication (who often have the final say as to which images run in an editorial use) usually allow more leeway for selecting images that are over the top, such as a player getting flipped or doing a celebratory dance in the end zone. These are images that often aren't used. But if something I had a photograph of was mentioned in the copy, I could often persuade editors to use what I felt were the best images. My argument would be, "Hey, it's mentioned in the copy," or "The athlete was quoted referring to this."

This photo of Indianapolis Colts player Brandon Stokley celebrating after scoring a touchdown in a play-off game displays a journalistic approach that would catch your eye and likely lead you to read the story. ©Kevin Terrell/NFLP

Story editors usually want photos to display something pertaining to the piece, and the best way for sports photographers to do this is by getting images of the key play and players. I can't stress that enough. Think about how many times you've grabbed the sports page from the newspaper and were immediately attracted to a photo on the front page. This likely led you to read the caption under the photo, which in turn might have prompted you to read the story. All of this came about because of the impressive photo you saw on the front page.

News editors think that we read newspapers and magazines because of the copy (the text on the pages), and most of us do, but how many newspapers and magazines would sell if they didn't contain photography? Most biographies, even if they're paperback, have photos in the middle of the book. Although the written word can stand alone and be informative and intriguing, it's the imagery contained in these editorials that we spend time examining to get a better understanding of the story. The photos add to the piece and enable us to get a better description of what we're reading. All of us can paint pictures or conjure up images in our mind from something we've read, but photos give us a more accurate vision than anything we could imagine. In fact, photos can ruin a vision of what we've imagined from reading just the text, which is why some people refuse to look at photos of something or someone they've read about.

Often, when we sports photographers or photo editors look through a copy of a magazine such as *Sports Illustrated* or *ESPN The Magazine*, we peruse the issue cover to cover, examining all the photos. We pay little regard to the features and columns in the magazine. We admire and critique the images and read the photo credits. We also think of other photos we might have seen of the same play or the same subject and compare it to what we see in the magazine. Basically, we edit.

Although a photo editor through his selections often has some input on what photos to use, someone above can and often does overrule us. Some of the most impressive images ever shot haven't been published because a managing editor or someone above the photo editor decided not to print a certain photo for any number of reasons. This can be frustrating, but it is part of the job. It's important to be flexible when you're a photo editor.

Getting a shot of a player making a big-time play usually ensures that an editor will keep a shot. Here, David Tyree of the New York Giants made a great catch that helped them to victory against New England during Super Bowl XLII. ©Kevin Terrell

Believe it or not, this photo almost never ran in an NFL publication. My copy editors were concerned about the blatant penalty of Cornelius Bennett grabbing Jay Schroeder's face mask. Thank goodness they had a change of heart, as it has become the most published image in my portfolio!
©Kevin Terrell/NFLP

Commercial Use

Editing for commercial projects is somewhat different from editing for editorial use. Commercial editing usually entails looking for images that get across a message that an advertiser or client wants to convey in an advertisement or promo piece. Some clients want images that scream out to you and make even the non-sports fan stop and pay attention to their ad or the packaging of their product. Others just want to see their product's logo somewhere prominent in the photo. Gatorade, for example, likes to see its logo on towels, on coolers, or on cups in players' hands. Shoe and apparel companies such as Nike and Reebok are big on this display of logos, too.

If a client doesn't have likeness rights to athletes or teams, it's looking for generic photos. In football, these could be of the goalposts, grass, yard markers, hash marks, taped hands, equipment, or towels and bags in the bench area. In basketball, they could be the ball, the hoop, the backboard, the hardwood court, an overhead of the lane, and so on. In baseball, they could be the ball, a background of the stadium, or perhaps a dugout shot. It all varies with the product that the client is trying to advertise.

When a client has the license that gives it the approval to use a player's likeness in its ads but has not struck a deal with an individual player, it often relies on the rule of six to get around this. This rule says that you can consider six bodies in a photo as a photo of the team (even if they're from opposing teams) and not just the individual players in the frame. In football, this brings about the need for group horizontal action photos.

For example, a photograph of a star running back such as LaDainian Tomlinson of the San Diego Chargers running in the open with defenders in pursuit of him and a couple of other Chargers players in the image can be considered a shot of the Chargers offense, instead of a photo of LaDainian Tomlinson as an individual. This rule of six is frequently used in team calendars and print ads, and as I mentioned is typically shot horizontally. You'll often see team-of-six photos in print ads involving the teams playing in an upcoming or recently played Super Bowl. This usually means that a client didn't strike a deal with any of the key players on the opposing teams; in the client's haste to get something out, it just went with a team action photo.

Here is an example of where the "rule of six" applies. Although New York Giants running back Tiki Barber is the featured player in this shot, the extra players in the shot make it an image of the New York Giants, instead of just a photo of Barber. ©Kevin Terrell/NFLP

Image Criteria

Regardless of the situation, when an editor is selecting photos for an editorial or commercial project, he generally uses certain criteria. These criteria include quality, artfulness, peak action, and stock images, discussed next.

Quality

Good exposure is essential to getting a photo selected. Most editors require their shooters to correct the color, contrast, and sharpness on images before submitting them, but sometimes editors still receive poorly exposed images, and little to nothing can be done with them. The better the exposure, the more strongly an editor will consider your submission for selection.

Artfulness

Editors are always looking for unique action or feature photos. A lot of emotion occurs on the sidelines or in the dugout throughout a game that presents an opportunity for some nice images. It really depends on the way you shoot something. Try to be aware of the available light and the various surroundings of the stadium or arena you're in. During pregame warm-ups or moments between the actual game action, think of what you can use or include in an image to create an interesting shot. It could be the goalposts, pylon in the end zone, or a lone helmet on a bench. Use your creativity and take a chance. The shots could be motion blurred (shot at slow shutter speeds), extreme close-ups, or zoom photos. Your camera is your tool, so try to use the various exposure settings and your flash. This could lead you toward some interesting shots that are different from what most shooters photograph.

The pregame introduction is a good time to experiment with shooting artsy shots. This photo worked because of the lighting that created a nice silhouette of the player. ©Kevin Terrell/WireImage

Peak Action

Editors always need photos that capture good hard-hitting action. Look at the opening spreads in *Sports Illustrated* or *ESPN The Magazine*. The "Leading Off" (*Sports Illustrated*) or "Zoom" (*ESPN*) shots are usually tight, horizontal action images. They don't have to show a touchdown, a basket, or an acrobatic catch in the outfield; they just have to be great action shots. These types of shots are useful not only as double trucks (spread across two pages) in magazines, but also in print ads and calendars—even when they're not of the rule of six. These types of images pay a premium and are always in demand. Sometimes, overhead shots are preferred for this type of image. For some shooters, horizontal action is easier to get than a tight vertical action shot of an individual player because of the difficulty of framing a subject while he's in motion, especially if you're shooting him tight.

Still, vertical images are needed and work well in just about any kind of commercial or editorial product that calls for an individual photo rather than a group shot. Editors want both horizontal and vertical images of peak action shots, although more end up framed or cropped horizontally.

Stock Images

There is *always* a need for stock imagery. Regardless of who or what a photo editor is selecting images for, he is always on the lookout for stock images because of the uncertainty of what will be requested. While you are covering an event, it is worth your time to get images of almost every player on offense and defense in football and every player in basketball, baseball, hockey, and soccer. An editor will obviously keep a great action shot of an athlete, but he also needs shots of players between plays or doing something on the field with or without the ball, bat, or puck. You would be surprised how often images of this nature are needed, as you can't always capture great action shots of every player on every team. I used to receive images from an NFL shooter who took shots of every player on the team in every game. He submitted them in slide sleeves from jersey number 1–99. Although some images were great action shots, most were just average shots of a player either in his position or standing around between plays. Despite the photos' ordinariness, the shooter made a ton of sales shooting in this manner, because whenever a client needed an image of a player—regardless of who it was—this photographer had some image on file of the requested player.
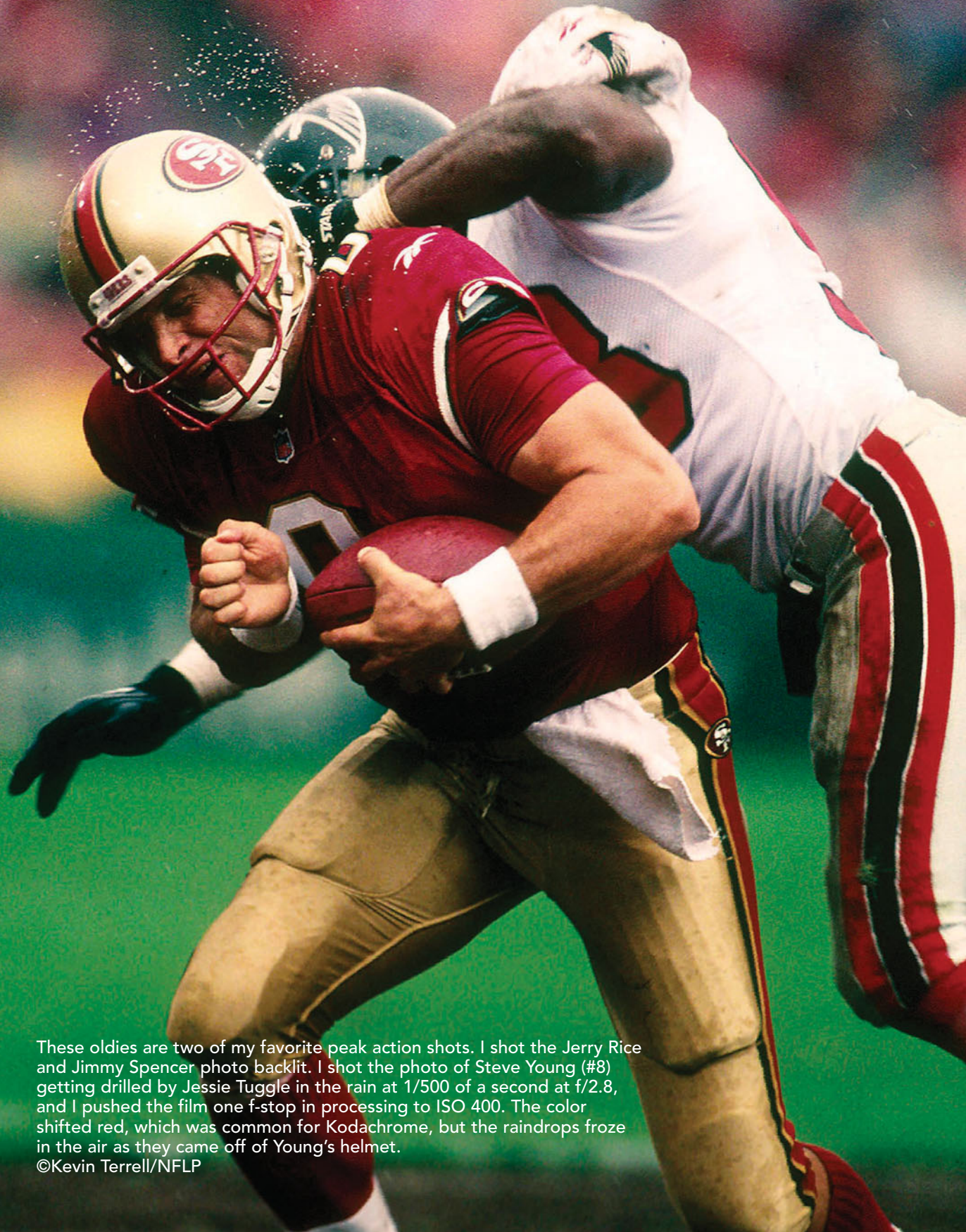
These oldies are two of my favorite peak action shots. I shot the Jerry Rice and Jimmy Spencer photo backlit. I shot the photo of Steve Young (#8) getting drilled by Jessie Tuggle in the rain at 1/500 of a second at f/2.8, and I pushed the film one f-stop in processing to ISO 400. The color shifted red, which was common for Kodachrome, but the raindrops froze in the air as they came off of Young's helmet.
©Kevin Terrell/NFLP

What Not to Submit

A photographer should never submit to an editor images that are soft or out of focus. There are too many good shooters and top-notch photos for an editor to have to keep photos that aren't tack-sharp. Sure, some images break up or pixel-late when they're blown up or when they're cropped really tight, but a soft photo reproduces soft and doesn't look good at no matter what size it's used—unless the medium is a newspaper, which tends to be more liberal in its standards of sharpness. The only time that submitting a soft or somewhat out-of-focus picture is okay is when you're submitting a newsworthy image or a record-breaking play.

If this were not the last play in Super Bowl XXXIV, this photo, shot from an overhead seating section, would have been tossed in the trash because it's very soft. When Kevin Dyson caught the pass, the fans jumped up in anticipation of him scoring. I had to maneuver my lens between the fans to get in position for this shot. ©Kevin Terrell/NFLP

Rarely do editors select a photo of a player running away from you. If you can't see the player's face, you probably shouldn't submit it. A wide-angle photo of a great jump shooter like Kobe Bryant of the Los Angeles Lakers taking a game-winning shot from the back might be the exception, but in just about every other sport, especially in football, refrain from submitting images of the back of players. If you can read the player's name on the back of his jersey, you should perhaps look at other elements surrounding that player, such as the defenders who are coming toward you.

Try to avoid having a player's legs or arms cropped out of the frame because it can lead to some awkward photos. Although there are times when the ankles and feet of an athlete are cropped out of a tight photo, try to avoid submitting loose images in which this occurs. If you're shooting loose, try to get the full body in the shot as the athlete approaches you, leaving space around the player. Use your better judgment in deciding what to submit. Always include pictures in which the arms are within the frame.

In both of these images, the subject's limbs are cropped out. Although it's difficult to crop images perfectly while you're shooting eight frames per second, you improve your chances of getting an increasing number of images selected if you submit more that are full frame. ©Kevin Terrell

The ball should always be in the frame when you're shooting an athlete who is handling it. If you happen to crop out the ball when you're shooting, or if your reflexes weren't quick enough to capture the ball just as it's in flight and leaving the player's hands or flying off a tennis racquet or bat, it's probably best if you don't submit that photo. The exception is shots of tennis, baseball, and hockey players finishing their swings.

Tools of the Trade

Before the days of digital cameras, I received more than 500,000 35-mm color transparencies (slides) and mounted negatives per year. I spent several hours per day with a Schneider Lupe pressed up to my eye and the loupe pressed up to a sleeve of slides on an upright-aligned light box. I scanned each slide with my right eye, often stopping when I saw something I thought was nice or just a good photo. I was liberal in my editing in both preseason and early regular-season games because I felt it was important to keep material on every player, especially the stars, because if a player happened to suffer a major injury, I wanted to be sure I had photos of him before he was hurt.

Now that we're in the digital age of photography, you can use a software program like Photo Mechanic to browse and edit images. It displays the images on your computer screen as if they're a proof sheet on a light box. It allows you to rotate and delete images, and it opens them in Adobe Photoshop if you have it loaded on your computer.

The digital world has also made it somewhat easier and faster to find a certain image that a client is looking for. For instance, instead of having to sort through and find a file full of 35-mm slides and then view them on the light box, with digital, most agencies that post images on a Web site can search for a particular player or team or from a certain game that a client might be interested in. Web sites have also helped immensely in that regard. Now clients can practically choose directly from the source instead of waiting for someone to pull images for them. This is where changing to the digital world has benefited clients.
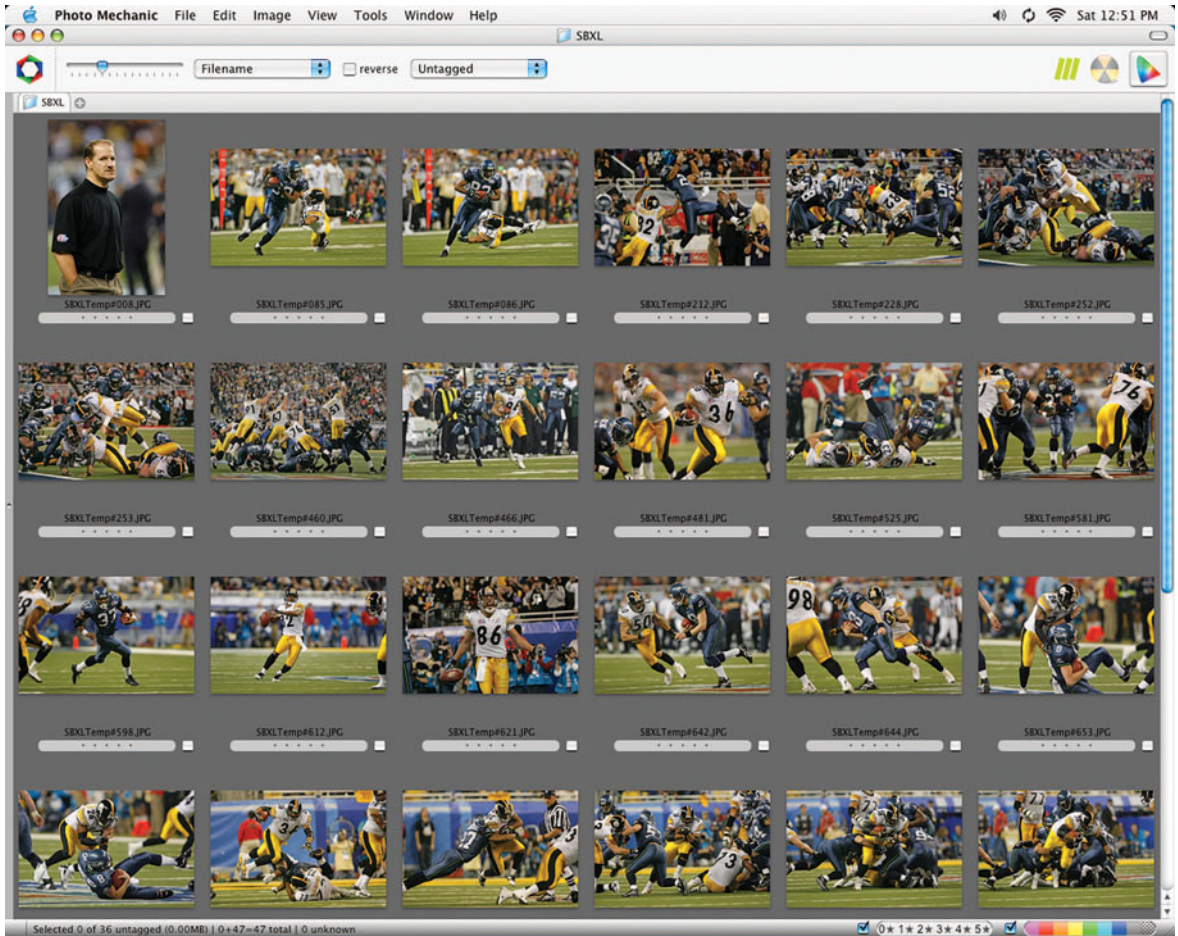
Photo browsers such as Photo Mechanic make life easier for editors and photographers alike, versus using a light box to view slides in the days prior to digital cameras.
Illustration images ©G. Newman Lowrance
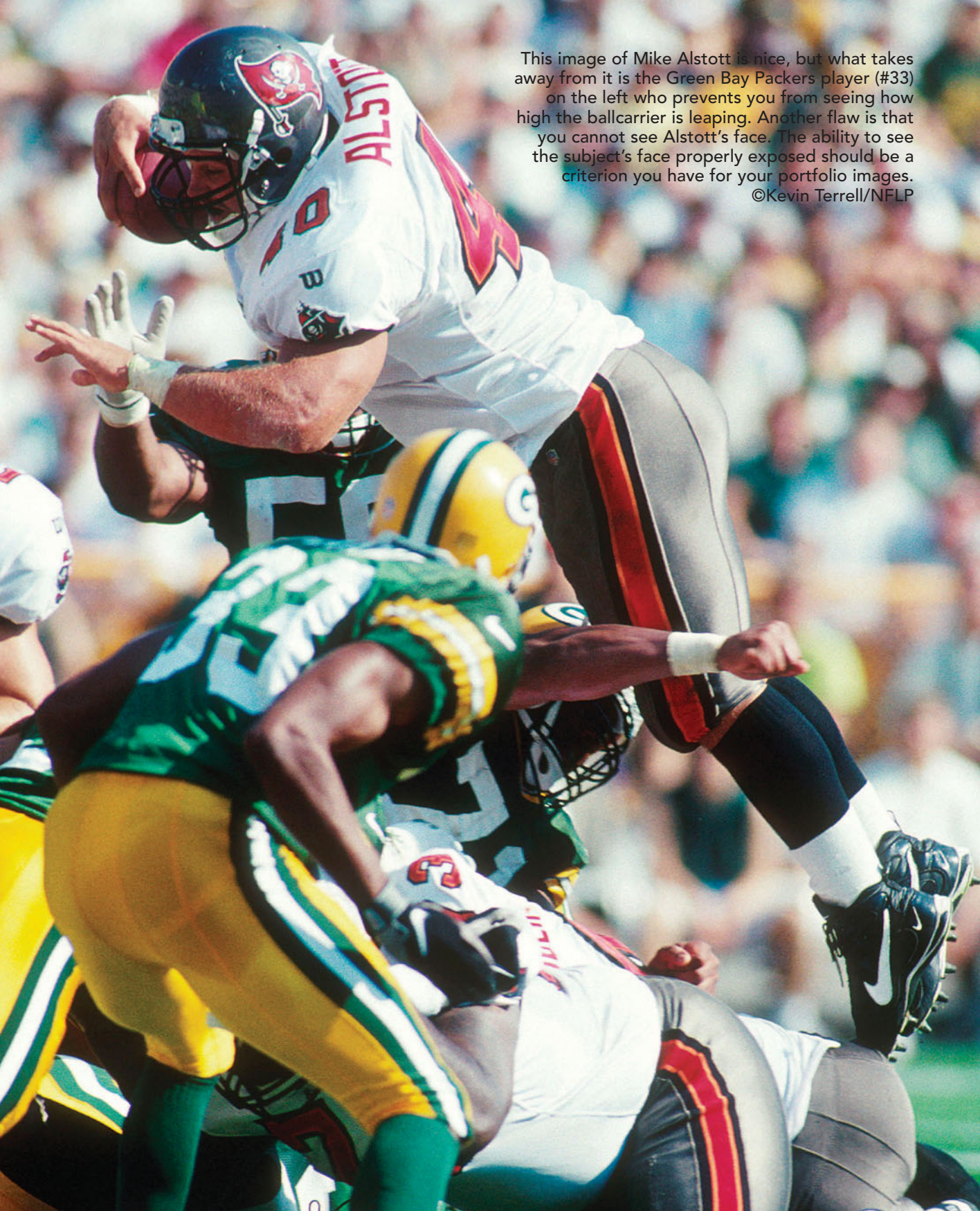
Portfolio Submissions

Just as photo editors differ on what they like to see submitted from a game, they also differ on what they like to see submitted in a portfolio. Before the digital age, back when slide film was all the rage, I always preferred to see original slides when I received a portfolio. If original transparencies weren't available, 8×10 prints were my next preference. I also welcomed tear sheets from those shooters who had been published. However, I never wanted to see duplicate slides. Duplicates sell a photographer short and aren't an accurate representation of the photographer's best work.

When submitting your portfolio, always send in your best images. Don't just submit your favorite photos or the ones that mean the most to you, but your very best. Great action photos or images that reflect emotion are key ingredients that make up a strong collection. Your portfolio is in essence your résumé and your interview combined.

Send a variety of action and feature photos in both horizontal and vertical formats. If you have some nice images that you have shot with a flash, send those in, too. Although you are trying to show your skills as a sports shooter, and an editor will more heavily scrutinize your action photos, there is so much that occurs before, during, and after a game. An editor wants to see your best feature shots.

In this photo of Johnnie Morton, you can clearly see that his face is out of focus, and the sharpest part of the image is his legs and feet. This is one of the first things a good photo editor would notice, and it's why I never placed it into the NFL Photo library database. Use this same criterion when choosing the images for your portfolio. ©Kevin Terrell/NFLP

This image of Mike Alstott is nice, but what takes away from it is the Green Bay Packers player (#33) on the left who prevents you from seeing how high the ballcarrier is leaping. Another flaw is that you cannot see Alstott's face. The ability to see the subject's face properly exposed should be a criterion you have for your portfolio images.
©Kevin Terrell/NFLP

Now that everyone is shooting with digital cameras, editors prefer to receive a shooter's portfolio that is burned to a CD instead of receiving prints. That way, they can make a more accurate assessment of a photographer's shooting skills— and his ability to use Adobe Photoshop. Editors are busy; the ability to pop a CD into their computer and view images saves them a lot of time.

Many shooters have their own Web sites, which have proven to be a convenient way for an editor to view a portfolio. The only problems occur if a site is down or isn't updated with a shooter's most recent spectacular shot. Some shooters would include an impressive shot on the portfolio CD and then include a cover letter asking me to go to their site. When I would go to the Web site to see what else they had shot, the impressive image(s) on the CD weren't uploaded to it. It should be on both.

Your portfolio should be the most impressive representation of your shooting skills. Be your own worst critic to ensure that your portfolio includes your very best body of work.

In my biased opinion, football is the best sport to photograph. No other sport displays the intensity, passion, athleticism, diversity, and acrobatic beauty of what's demonstrated on the gridiron each week from August through February.

In football, it's possible to capture a good shot on almost every snap. Consider that on a single play from scrimmage, you could shoot the quarterback calling signals as he awaits the snap from center and then get him as he either hands the ball off to a running back or rolls out or drops back to pass. You could also shoot the cohesiveness of the offensive linemen as they wage battle in the trenches with opposing defensive linemen. Alternatively, you could aim your lens at the running back who is going to block, carry the football, or flare out for a pass. Or you could follow a receiver as he blocks or sprints upfield on a pass pattern. By moving quickly and shooting rapidly before, during, and after the quarterback takes the snap from center, you could photograph some of these things all on the same play. And this is just while shooting the players on offense!

A sporting event is a compilation of spontaneous occurrences in which no one can predict exactly what will happen and what the outcome will be. As a photographer, it is up to you to capture as many of these moments as you can every time you step onto the field or court. Regardless of the sport and the level you are photographing, keep in mind that your photo editor expects nothing but the best from you, and you should expect it of yourself.

Baseball
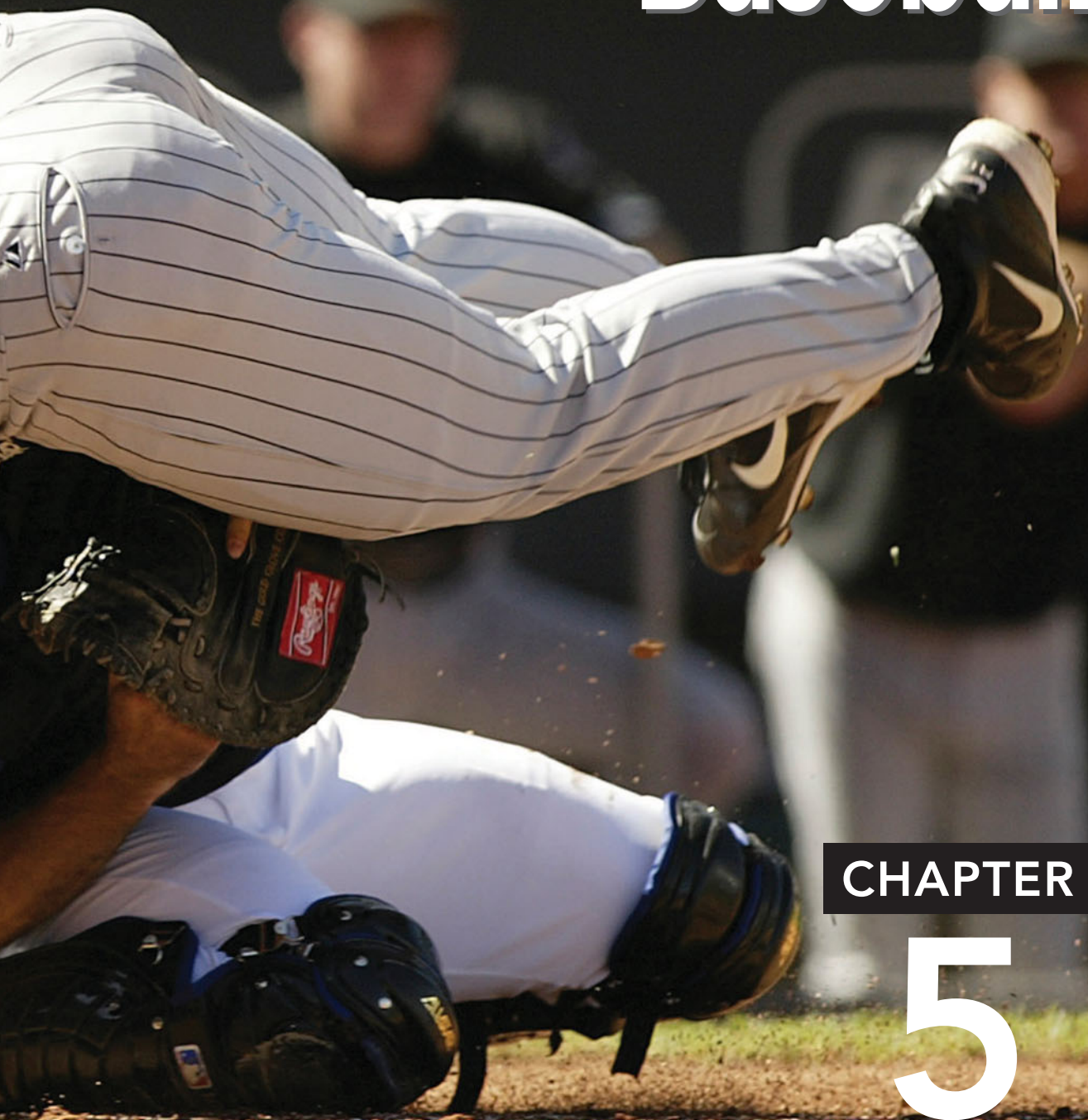
Baseball is perhaps the most familiar sporting event in America, and it's probably the most photographed sport because of all the youth baseball that's played across our nation. The sport offers some advantages when it comes to photography because of the way the game is played. Since a lot of the action centers on the batter and pitcher, it's relatively easy to capture the batter swinging the bat and the pitcher throwing the ball. In addition, you can shoot the fielding players waiting in their stance as the pitch is thrown. These shots are considered "safety" shots, because you probably won't capture each player fielding a live ball during one game, especially when you are concentrating on the batter or pitcher. Getting an actual action image of a fielder can be a challenging part of photographing baseball.

Although baseball is often delayed between pitches, between innings, and during pitching changes, you still need to notice all the nuances that the game can bring so you can capture the individualism and feel of the sport. Another good reason to pay attention is when foul balls are hit within the photo well areas, sending all photographers running and ducking for cover! Although I haven't been directly hit by one of these fouls, I've seen several of my colleagues hit over the years, so I take notice when I hear the crack of the bat hitting the ball.

Generally when I photograph baseball, I bring two or three cameras, a 300-mm or 400-mm lens, and a 1.4X teleconverter, depending on how close to the field I will be. If you are shooting a youth event, you can probably get away with a long zoom lens such as a 70–200 mm, as you will most likely be closer to the field and players than you would for a professional game. Regardless, preparation is always an important factor when you decide on the equipment that you need. Other preparations include obtaining the starting lineup, or a list of the players, so you'll know who is playing which position and who the batters are when they come to the plate. If the players don't have numbers visible on their jerseys, you can always take notes, or better yet use your camera's sound recording button (if it has one) to help you later during your edit. This way, as you go through your images during post-processing, you will have a record of who that player actually is without trying to go by memory.

Baseball is also different from other sports in terms of your shooting positions, because you remain in relatively stationary locations, unlike in football or soccer. You don't have to move too often to follow what you intend to shoot, unless it's between innings or you need to shoot a relief pitcher from the other side of the field. I know many professional shooters who stay at one spot for the entire game. Major league stadiums generally have photo wells or areas along the first and third baselines and sometimes behind home plate to photograph from. Most of these wells are on the outside ends of the dugouts, although some stadiums

Unless you are already concentrating on an infielder, it can be difficult to capture him as he fields and then throws the ball.
©G. Newman Lowrance

have them on the inside, too. Another position that photographers prefer for covering the action is elevated or overhead levels. For that situation, shooters might want to use a 500-mm or 600-mm lens, since they will be much farther away from the action. When photographers shoot in this manner, they might also mount a remote camera at field level to capture plays at the plate or at a certain base so they can have more coverage of the event. Every stadium is unique in these aspects, so you should be prepared to bring additional bodies, different focal lengths of lenses, and other equipment that you will need for your particular positioning.

Positioning

Baseball typically has several different vantage points to choose from, with specific spots for photographers at the major-league level and most major college levels. Whether you choose to shoot from first base, third base, behind home plate, or perhaps overhead, the following are examples of these locations and what to look for from these vantage points.

Shooting from First Base

For the most part, I prefer to start out shooting from the first base vantage point, unless those spots are already filled at a big game or a stadium that has limited room in the photo wells. That's because it's possible to cover most of the action for stock as well as journalistic approaches from this location. For example, while you are shooting a player batting, you can typically shoot vertically as he waits for the pitch. Think of how many baseball trading cards are shot showing a batter at the plate. They tend to tight, vertical images of the batter as he waits in his stance or takes a swing. When the batter swings and hits the ball, follow him during his run to first base. As you are doing this, watch for the batter's eyes, because they usually tell you if he likes where the ball is going. A good indication of this is how he is running. You should be able to tell immediately if the batter has a chance for an extra base, because he is running hard down the line. Of course, if he hits a routine fly ball, his pace usually slows down because he realizes he has probably just made on out. If he is certain he has hit a home run, he might stand at the home plate area and admire his ball for a few seconds. Regardless of the situation, this is a nice way to capture the player during his entire at bat. The nice part is you can obtain these shots from this first base vantage point whether the batter is left handed or right handed. Obviously, you will see the front of the uniform as the right-hander bats, while the opposite occurs when photographing a left-handed batter. Although the left-handed batter has

Whether shooting youth or major league players, you can get similar results. ©G. Newman Lowrance

his back to you while he's in his stance, he eventually will turn his head and body toward you after he has hit the ball before running to first base.

Another advantage of the first base line location is that you are in an ideal position for stolen bases and double plays that could occur at second base. If a player is on first base with less than two outs, it's highly probable that the next batted ball could include a play at second. If a batter hits a ground ball to the infield, the shortstop or second baseman covers the bag for a possible double play. The infielder who covers the bag will then rotate as he attempts to throw to first, and in doing so will turn right toward your lens. A typical shot from this situation occurs when the infielder jumps up as he throws to avoid the runner sliding into second base. Although this is a fairly common shot, it's always a good one to try to capture. You never know when the sliding player will make contact with the infielder and possibly flip him over. This can make a great image, and one that editors love to see. You might also get a great shot of a tag during a stolen base attempt, or a ball thrown by the catcher that gets past the infielder as he is cov-

From the first base location,
you can also get a shot of a
player admiring his home run.
©G. Newman Lowrance

ering the bag. Be aware where the base coaches and umpires set up on the field. I try to always shoot from either end of the shooting wells so that I can adjust my position as much as possible to avoid being blocked by umpires and coaches during peak action plays. They seem to work from habitual spots, so figure out where the best spot is that lines you up with the play and gets the coaches and umps out of your line of sight. Although they will move at times during a play and possibly get in your way, your planning might help to avoid some of those instances. You might even consider setting up for the play at second base before the pitch, especially if you don't have a reason to photograph the batter. In that respect, you'll already be prepared and ready to shoot if the play occurs there.

In addition, with a runner on first base, the pitcher sometimes attempts to pick him off or keep him close to the bag. This often occurs if a speedy runner or some-one who is known to steal bases is leading off first base. The runner might fre-quently slide back to the base if he takes a big lead. If you are watching for this shot, it is fairly easy to photograph, because you can prefocus on the first base bag and wait for it to occur. I like to keep handy a 70–200-mm zoom lens on a

Knowing the situation: When a runner is on first base with less than two outs, be prepared to shoot a possible double-play situation, which is always good to photograph. ©G. Newman Lowrance

If a runner on first base is considered a threat to steal, a pitcher often throws over to pick him off. Concentrate on the runner getting back to the bag on these pickoff attempts. ©G. Newman Lowrance

second camera body just for this situation and other infield shots. Again, knowing the game's tendencies is an aid in determining what you plan to photograph.

Shooting from first base is also a perfect time to capture tight images of the first and second basemen, or looser images of the shortstop, third baseman, and outfielders. Naturally, if you are shooting the first baseman, you might need to switch from your long telephoto lens to a wider lens depending on the distance, but understand that you always have the option for tight candid shots versus wider shots when you try to capture him fielding a ground ball. These decisions are sometimes difficult, as you never know where the ball is going to be hit. You might be prepared for one situation, but another one will occur. For example, if you are holding a zoom lens waiting for an infield play and instead the ball is hit to the outfield, you will probably be too far away to shoot the outfielder moving toward the ball to make the catch. Of course, you can always shoot the play anyway, but odds are with the smaller lens, your composition will be too loose to get a good shot.
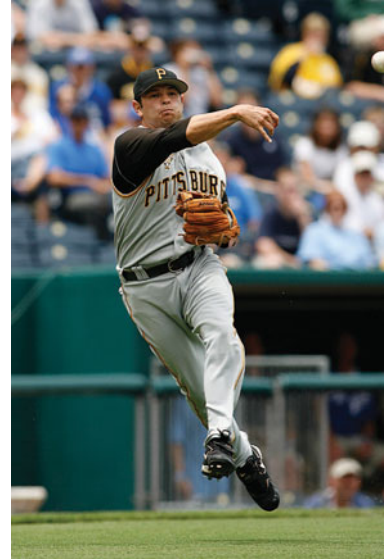
While shooting from the first base location, watch for the infielders as they pursue the ball or prepare to make a throw. ©G. Newman Lowrance

As I mentioned earlier, it is often difficult to capture infielders in action. You might be focusing on the batter as he waits on a pitch, and as he hits the ball you initially won't know where the ball is going. By the time you realize where it was hit, the fielder has already picked it up and is throwing to the bag. Odds are, if you weren't already concentrating on a specific infielder, you won't be able to get a shot of him if he has to dive for a sharply hit ball. The other approach is to literally guess which infielder it might be hit to, and in some cases you guess correctly and can shoot the infielder ranging to the ball, picking it up, and then throwing to a base. Another common approach is to shoot the warm-ups between innings. Usually, the first baseman keeps the infielders loose by throwing them ground balls as the teams switch from the field. This is a good opportunity to photograph each fielder throwing the ball back to first. It might not be a real action shot, but it's another good safety shot in terms of capturing all the infielders throwing the ball.

It's always good to get a fielder in action, but you can also shoot "safety shots" as the players loosen up between innings. ©G. Newman Lowrance

Shooting from Third Base

The opposite view from first base along the third base line can also be a great location. You might initially think that you can get the same shots from this vantage point, but some things are different. You can still shoot the batter at the plate, because a left-handed batter faces you in his stance. Conversely, even though a right-handed batter has his back facing you during his stance, he might pull the ball down the left field line, and his body will turn that way before he heads to first base. At this point, you can shoot the player watching the ball just as the example explained from the first base vantage point. However, because you are not in a good location to photograph the player as he runs toward first base, you might want to pull away from the batter after he has hit the ball and try to follow where the ball goes. If you are fast enough, you might be able to photograph the shortstop or third baseman fielding and throwing the ball to the eventual base. This throw could lead to another play at second base if a runner was previously on first base.

Remember to watch the base coaches and umpires, because they tend to line up directly between you and second base and block your shot. Again, you might get a contact play, albeit now from a different angle. Of course, if you are shooting Major League Baseball, you probably won't capture the fielder ranging or diving to the ball, because in most instances the action is too fast. A good way to play the odds is to notice where the infielders are positioned. Are they playing "back" for a possible double play, or are they playing "in" for a play at the plate? Maybe the entire infield shifts for a pull hitter, or it hugs the lines late in the game to prevent hits down the lines. All major league teams have scouting information that aids them in aligning defensively. Use your eyes to view where they are playing as you focus in on a player. You might get lucky and capture an infielder diving or ranging to a sharply hit ball. Of course, the infrequency with which these plays occur also adds to their difficulty, but a little preparation can help you make some decisions in these situations.

Shooting from this vantage point also places you in prime position when a base runner comes across second base and digs for third. Usually, the base runner is advancing from first base and is showing some great facial expressions while running as hard as he can to third base. He might even be sent home on the play, and you can shoot him as he runs through third base. Just be prepared for a play at the plate that might follow this situation.

Similar to the first base vantage point, you can photograph a batter from the third base position as he watches his ball in flight.
©G. Newman Lowrance
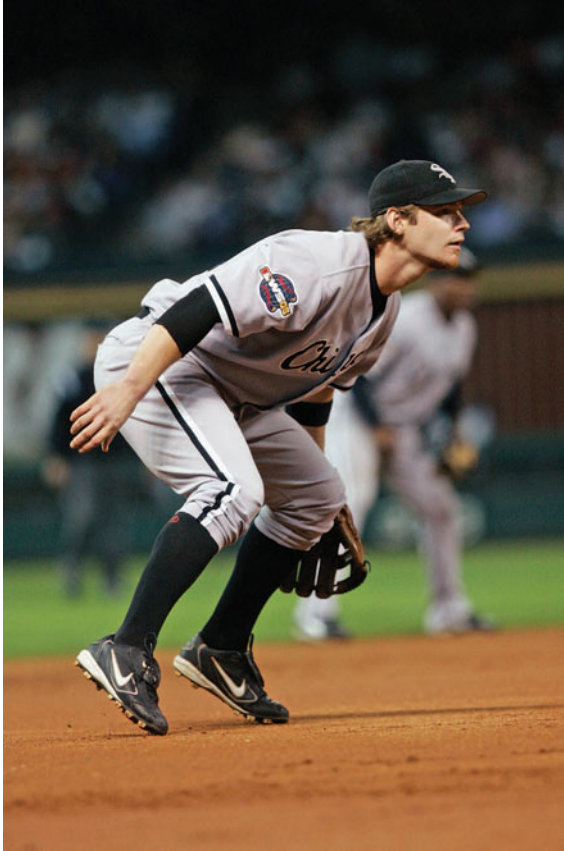
From the third base line, you can get nice isolations of the infielders near you.
©G. Newman Lowrance/WireImage

Watch for great facial expressions as the runner digs from third to home plate to try to score.
©G. Newman Lowrance

Sliding plays at third base aren't as frequent as pickoff attempts on the first base side, but sometimes a runner slides to the base just before the ball arrives. This is often a great opportunity to capture a runner going full speed before sliding head or feet first into the bag. Again, know the situation before the pitch, and realize the different plays that might occur when the batter makes contact.

Another situation to look for from the third base side occurs when a first baseman is holding a runner close to the bag. As explained previously, the first base location is ideal for capturing the lead-off runner before he dives back to the bag to avoid getting picked off. Conversely, the third base location is better for capturing the first baseman catching the ball and applying the tag. This photo works well as a horizontal image showing the runner diving back to first with the ball

You can shoot the first baseman in action from the third base vantage point as he receives a throw or attempts to apply a tag. ©G. Newman Lowrance

heading toward the first baseman. This also works well if you can get a tight vertical image of the first baseman making a catch from the pitcher. Also watch for the first baseman to catch throws from the various infielders who are attempting to throw the base runners out.

Whereas the first base line allows you to photograph tight and candid shots for the right side of the fielders, the third base vantage point offers the same for the left side. Often, the third baseman or shortstop has several plays when balls are hit to him. The left fielder is frequently busy, too, especially in youth leagues when most players bat right handed and generally hit toward that side of the field. Of course, you can always get your safety shots of the fielders in their respective positions if you don't happen to catch them in action fielding a ball.

Shooting the Pitcher

Photographing the pitcher is probably the easiest shot in baseball. First, he is in a stationary position. Second, you can capture the pitcher from several different angles since he is in the center of the field.

I always make sure to get a few images of the pitcher behind home plate because the ball is in a direct line of sight. Shooting with your high-speed camera, you can capture the many different stages of a pitcher's wind-up. You can see the leg kick, the release point, and the strain of a pitcher's face as he throws the ball, all in a few frames. Upon viewing these images, you can see why pitchers commonly have arm problems. You can literally see how much stress is put on the elbow as pitchers throw. If a stadium doesn't have an actual location behind home plate for photographers, you can also shoot this angle from the stands.

Depending on the pitcher's throwing arm, you can photograph him from the side at the first and third base photo wells. It's always a good idea to shoot the pitcher from several different angles, as well as vertically and horizontally, because you never know what an editor or client might want to use. For most occasions, you would photograph a left-handed pitcher from the first base line and a right-handed pitcher from the third base line so that the pitcher faces you as he turns to throw to the plate. Although you can shoot a pitcher from practically any vantage point, this is a more common approach than shooting from the opposite side of his throwing arm. Also, don't forget about other common situations for pitchers, maybe capturing them in their "stretch" position or while they're looking over to a runner or getting the sign from the catcher.

Shooting pitchers from behind home plate gives a great view of their throwing motion and shows their intensity.
©G. Newman Lowrance

You can shoot many angles of the pitchers from various positions using both horizontal and vertical compositions.
©G. Newman Lowrance

Shooting the Outfielders

Shooting outfielders can be a difficult task for a photographer. The problem is their distance from you. If you are concentrating on a batter, pitcher, or infielder with a long zoom lens or even a 300-mm lens, and a ball is hit to an outfielder, you will likely be too loose for the play. Conversely, if you use a long lens with a teleconverter waiting for some outfield action, you might be too tight for a play at the plate or a double play and still not have a good action shot of an outfielder. In these respects, some of your decisions depend on what level of baseball you are shooting and what equipment you have. Obviously, a youth game is completely different from a major league game in terms of lens selection, but the perspectives are similar.

Many times, it is challenging trying to capture an outfielder in action. When I say *action*, I'm not referring to a routine fly ball with the player camped under it. The best action shot that a photographer can have for an outfielder is when he dives for a ball or when he leaps at the outfield wall attempting to catch the ball. As I mentioned, the distance is already a disadvantage, and the frequency in which these plays occur is even more of a factor. Occasionally, this distance can be helpful when you shoot a looser horizontal image of an outfielder leaping up against the wall, because it can be visually graphic to capture the expanse of wall and the player high in the air. The downside is that you might try to capture these shots for several games without them transpiring.

Another situation is when you have the opportunity to shoot an outfielder running toward you, diving for the ball. When this occurs, you are helped by the fact that the player is getting closer to you as he is running. The other aspect here is that other players or umpires might move right in front of your vantage point as you follow the player. Although you can't do anything to prevent this, you still need to shoot freely when you see a play of this nature unfold.

Of course, when and if any of these photo opportunities do occur, you might not be prepared with the right lens. This fact is perhaps less likely now with digital cameras and their respective focal length multiplying factors. Currently, most professional Nikon cameras shoot with a 1.5X multiple factor, and Canon's EOS-1D Mark II and Mark III cameras have a 1.3 ratio. In other words, for Nikon users, a 400-mm lens would then have a 600-mm focal length. A Canon user's 400-mm lens would become a 520-mm lens. Don't forget that the aperture setting of the original lens doesn't change. As an example, a Nikon 400-mm f/2.8 lens becomes a 600-mm f/2.8 lens, so you gain a one–f-stop advantage in low-light situations. This allows you to be closer to the outfield activity and acquire a tighter shot.

Because outfielders are the players who are farthest away from you, a long lens is mandatory to get good results. ©G. Newman Lowrance

Shooting from Overhead Locations

Although most youth photographers don't need to shoot from an overhead or elevated position, major league shooters often use these locations as a viable option for a different perspective. Some of the most famous baseball photographs have been taken from overhead locations, and you can get similar results by using the same approach. Your view is typically unobstructed across the whole playing field, unlike from field level, where other players and umpires can get in the way. Granted, the area behind home plate has a fence to protect fans, but if you are off on the first or third base lines, this shouldn't impede your view. You might also find it easier to follow the action from overhead, because you can pan from an outfielder throwing to home plate quicker from this position than being down on the field, where you and your lens might have to make a big turn.

Because you are farther away from the action at these overhead locations, a long lens is a necessity. Even with the extra length that the digital cameras give you, a 300-mm lens with a teleconverter is probably the minimum usage for capturing a particular play from an overhead location at most major league stadiums. If you want to show a wider view, other lenses will suffice. However, for a particular play at the plate, a tighter shot probably makes a better picture, even though you are up high.

Plays at the Plate

I would be surprised if most baseball shooters didn't regard a play at the plate as their favorite to try to capture. Because baseball is mostly an isolated sport in terms of the way it's played, it's always nice to capture plays with more than one player. It's difficult to capture good plays at the plate because you have no control over whether the catcher will be facing you or whether he will block your view of the tag. If you are on the first base line, you will undoubtedly see the base runner's face as he is running toward home plate, but the catcher might be in front of the plate with his back facing you. In these situations, you might capture the action, but you might be on the wrong side in terms of having the best angle. Similarly, if you are shooting from the third base side, you might have a better view of the catcher, but the base runner might block your view of the tag as he slides in. Regardless of the outcome, shoot freely when you have the opportunity for this type of play, because it can easily be the most dramatic and telling shot from a baseball game.
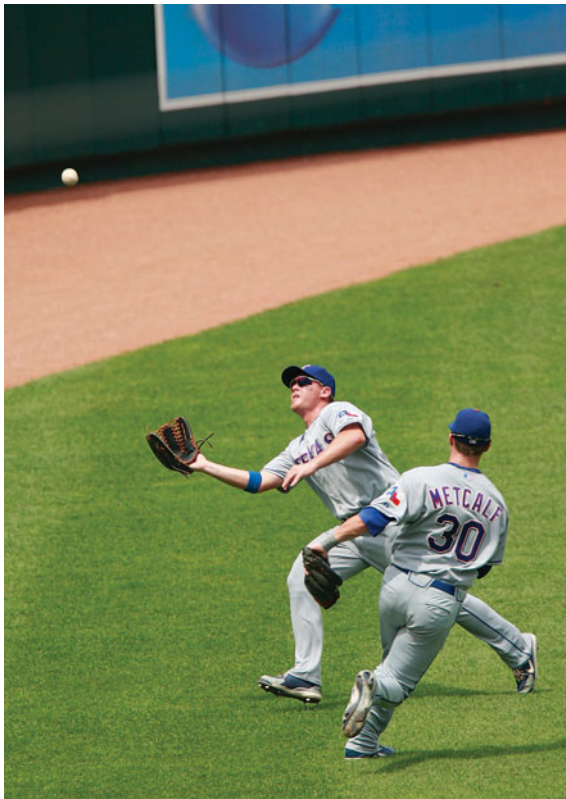
Overhead locations give a different perspective and feel to your images and a better overall view of the field. ©G. Newman Lowrance

Here is a play at the plate from the first base vantage point. In this instance, the base runner has turned toward me, which turned out to be the better location than the third base line. ©G. Newman Lowrance


Another play at the plate, this time from the third base line. These plays are always an adventure, because you never know what vantage point will make the better image. ©G. Newman Lowrance

Other Elements of Baseball

One good thing about baseball is the general feeling of relaxation among the players compared to other sports. It's easy to capture player portraits and great tight facial expressions. For major league teams that play 162 regular-season games, the players and managers are conditioned to the media and photographers who surround them during batting practice. This is an opportune time to take several portrait-type photographs or tight candid shots, because the players loosen up and mingle among themselves. You can also catch them in the dugout getting their equipment together as they prepare for the game. These events usually occur long before the actual game, so if you can get to the event early, you can capture these types of images. In addition, a few minutes before the game starts, it's typical to find several players throwing the ball to one another in front of their respective dugouts. This, too, is a great time to photograph tight candid shots.

Besides these aspects, be aware of the many other nuances of the game. You can often capture images of teammates mingling together prior to and during the game, or perhaps watching the game from the dugout. They often react and communicate with one another much like a family would, because they are together for the duration of a long season. Although baseball is a team sport, photographically speaking you have more chances to capture the individual part of the
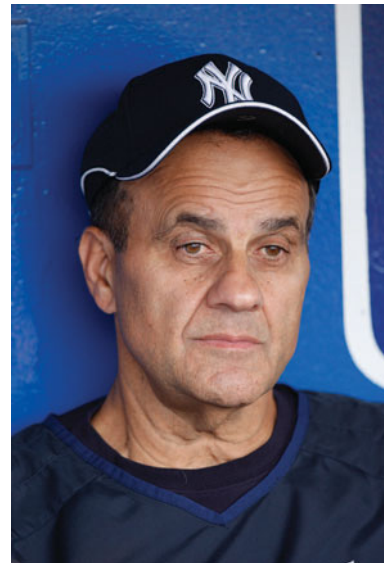
Shooting before the game is a great time to photograph the various players and managers up close.
©G. Newman Lowrance

Watch for the players' interaction with one another to reflect the team concept of the sport.
©G. Newman Lowrance

sport, and every individual is unique. Each player has his own rituals and approach to the game while in the dugout, waiting in the on-deck area, or getting set at the plate. Always keep your eyes open to capture this individual personality. If you're shooting youth baseball, you should have plenty of opportunities for this approach. Because you will probably be allowed more freedom to roam all over the field and perhaps the dugout areas, concentrate on players' emotions. You might surprise yourself with all the different ways to photograph a player. Images showing jubilation, pain, excitement, and disappointment are factors of most every game. These types of images are often stronger than the regular game action, because they can tell a story about the game.
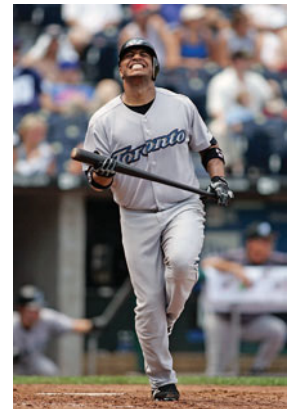
Keep an eye out for the individual aspects of baseball that you can photograph.
©G. Newman Lowrance

Using Remotes

You can avoid some positioning challenges by using remote cameras. Remotes are almost like being at more than one place at the same time. Depending on the stadium or stands that surround the playing field, you can usually find several areas to use a remote that is radio triggered from anywhere that you are situated within the stadium.

For one example, you could set a remote that is prefocused on the home plate area. I generally like to use my 135-mm or 70–200-mm zoom lens for these shots, set up for a wider view. It's usually better to be a little loose than too tight for this situation, as you can always crop the pictures later for a tighter shot if needed. I also like to set my aperture setting at f/4 or even f/4.5 to make sure that I have a sufficient depth of field. Of course, being able to do that will depend on the lighting situation. Remember to use a high enough shutter speed to stop the action with an automatic exposure for day games to allow for the possible

Using remotes is another option that can provide a different perspective while you are at another location during the game. ©G. Newman Lowrance

lighting changes. Regardless, if your current shooting position doesn't supply you with a good view of a play, you can reposition the camera stationed at your remote location. Just be sure to anticipate when you'll want to use a remote, because there is nothing more frustrating than being prepared in this manner and then forgetting to use it! In addition, shooters often point a remote at the first or third base bag to capture a runner sliding in or avoiding a tag. If this type of play happens a few feet in front of you, and you are currently shooting with a long telephoto lens, having this alternative vantage point might be a reliable option.

Setting up a remote requires some additional equipment, such as a magic arm or clamping mechanism to mount the camera to a post or rail. You will also need a trigger unit such as a pocket wizard transmitter and receiver, which will allow you to choose when to activate the camera when the action deems it necessary. This setup usually requires an early arrival as well, because rules might apply when you need to be out of the selected area where you install the remote. Make sure that you prefocus on the area and tape the lens so the focus ring doesn't move during the game. You will also need to set the lens to the manual focus setting; otherwise, the camera might focus on the background instead of what you intended.

In Conclusion

Baseball might seem like an easy sport to shoot because a lot of the photos come from fairly static spots on the field, such as the pitcher's mound and home plate. Many shooters get caught daydreaming as the game lengthens and the sun beats down. They sometimes forget that a dull game can get interesting in the later innings as relief pitchers are brought in. The whole rhythm of the game can change in a few short throws. Also, the relievers are as important to shoot as the starters, so don't leave early. Many big plays don't happen until the end of the game when teams start to play for the win and substitutions of players take place. If you are shooting one team more heavily than the other, place yourself on that team's dugout side, because you can get good shots of players and staff in the bench area. When players make a big hit or home run, they usually celebrate near their dugout, and their teammates greet them with cheers when they return to the bench. Think your way around the field as the game progresses, and you'll be able to capture the interesting and unique images that the shooters who are fixed in one spot often miss.

Football

Football has always been my favorite sport to photograph. Period. I love the action, the atmosphere, the intensity, and the diversity of images that it offers.

While I was growing up, I was like every other kid who had a favorite team or player. I had teams that I rooted for and against. Football fans love the game because of the action, the big plays, and, of course, the big hits. Photographers would probably tell you that they value those same elements while working a game. In fact, I would be surprised if most sports professionals didn't choose football as their favorite sport to cover.

Maybe my love for the game is why a lot of my photography success has involved professional football shots. Part of my enthusiasm for football was established when my father took me to my first professional game when I was young. Although I remember the freezing temperature, what really stood out in my mind was the aura of the surroundings. The huge stadium, all the fans, and the crowd noise were a new experience, and something that I'll never forget.

Going to that first game definitely amplified my interest in professional football. It led me to following the sport throughout the rest of my grade school, high school, and college years. When I finally dug back into photography and eventually worked for NFL Photos, I was fortunate enough to choose practically any game in any city to cover during the season. When the schedule came out each spring, I tried to predict which games would provide the best match-ups, which teams had the top star players, and what the weather and lighting situation might be at that game. As each season progressed, I sometimes altered my choices, because a rookie could end up being the hottest player in the league, or an upstart team that was predicted to do poorly could excel and surprise everyone. I undoubtedly wanted to cover these situations and shoot as many players and teams to market my images as I could.

Following the Action

Unlike most other sports that you photograph, football is one in which you need to physically follow the action. You don't have photo areas to stand or sit in while covering the action like you do for baseball, basketball, tennis, or hockey. All college and professional stadiums have lines painted around the field designating the photographers' areas. These lines form the basic angles for the situations that you encounter while photographing the game. Photographing football also requires running up and down the sidelines the whole game, trying to get the best angle for the next play. You almost find yourself thinking like a coach would, wondering where the next play might go.

Of course, all the other photographers at the game are thinking the same thing. Sometimes it looks like a track meet out there with all the photographers racing to get a good spot on the sidelines. At the next major college or professional game you view, watch what happens when a team makes a big play at the other end of the field. The sidelines become visibly active with shooters running down the sidelines to get into position for the next play while attempting to find a good location. Even after all your maneuvering to get a clear spot for shooting, some of the sideline personnel can move in front of you, restricting your visibility.

Over the years, the major college and professional sidelines have become increasingly crowded. There are more photographers, more national television coverage for the different angles that replays show, and additional sideline personnel. The sideline personnel include the chain gang, the ball boys, the sideline officials, the television officials, and even team officials. A few years ago, the league moved the photographers' designated area to 5 yards from the out-of-bounds stripe. This was partly for our protection, but it also cut down our angle when trying to shoot past the players' bench area. An example of this is the timekeepers for television who stand on the white border surrounding the field, usually at the end of the home team's bench. Their presence cuts down the photographers' angle of view tremendously, and they continue to stand in that area even during the game action. The only option for photographers is to move farther down the sidelines away from the action.

Hopefully, understanding all these elements will make you more appreciative of what it takes to capture great photos. As photographers, we enjoy the challenge, but it's not as easy as it appears. This is one main advantage while shooting at youth or high-school levels. Obviously, you won't have near as many other photographers fighting for positioning or camera crews and other team officials blocking your view. You're also much closer to the field; in fact, in most cases, you're likely allowed to stand right on the out-of-bounds line instead of being moved back like photographers who are shooting college and professional games.

To get the best results while shooting football, you really need to carry at least a 300-mm or 400-mm lens, along with a wide-angle lens for plays that occur within close range. Some photographers even carry an additional long lens, perhaps a 600-mm, but with the added focal length that a digital camera provides you today, those uses are becoming less common. I prefer to have both long lenses with me during a game, as long as I have a handy assistant or *grip* to carry the one that I'm not using at the time. Believe me, running around all day with one big lens is tough enough. Of course, the alternative is to use a teleconverter, which saves not only weight, but cost. I've used a teleconverter for years; however, I believe that using a true focal-length lens without a converter often results in sharper images.

Preparation

Come prepared with more equipment than you think you need just to be on the safe side. This extra equipment might include an extra camera body, extra batteries, a battery charger, plenty of memory cards, and perhaps an extra monopod. Depending on whether it's a day, evening, or dome game, you can determine which equipment is better suited for the event.

For a typical day game, I bring 2–3 camera bodies, my 400-mm f/2.8 and 600-mm f/4.0 lenses, a 70–200-mm f/2.8 zoom lens, and a 28–70-mm f/2.8 zoom for wide-angle shots. I also bring an extremely wide lens, such as a 20 mm or even a fisheye lens, if I want to shoot an overhead of the stadium or need to get groups of players together. For a night or dome game, I typically bring only lenses that have an f/2.8 aperture—thus, the "faster" lenses—so I can maintain shutter speeds of at least 1/640 or 1/800. These lenses allow me high speeds with lower ISO settings, which is desired in most situations. For youth level and even high school games, you can get away with slower shutter speeds, because at those levels the players aren't nearly as fast. But the main difficulty is the poor lighting that you often find while shooting evening events at these levels. You will need to shoot at much higher ISO speeds, such as 1600 or 3200, and have wide-open apertures and shutter speeds, perhaps at 1/250 and possibly slower just to get a reasonable exposure. Keep in mind that whether you are shooting day or night, at youth levels or professional ranks, you'll need to experiment with different settings to see what works best for your situation and the equipment you're using.

In the past, if you were shooting in low-light conditions using film—especially color transparency film—you probably had to push the ISO rating of your film one or two f-stops for special processing or use a high-speed film that would show more grain in your images. You needed to bring along several different speeds so you could adjust accordingly to any lighting changes that might occur. Sometimes you even had to switch a film canister halfway through the roll to a faster speed because of a change in light at an outdoor event; that was a waste of film, but something you had to prepare for. Today, with the latest features of the digital cameras that have reduced the noise factor, using a faster ISO rating of 1600 and even higher brings better results than in the past, with just a click of a button.

Another factor to consider when you are shooting an outdoor event is the temperature. Games that are late in the year can get extremely cold, especially in the Northeast or places like Green Bay or Chicago. In these types of conditions, plan ahead and select the clothes you need to keep you comfortable. I'll never forget a game in Chicago in late December. Temperatures were freezing, and the wind was howling from the lake right beside Soldier Field. I had forgotten my insulated shoes, and by the end of the game, I couldn't feel my toes. Needless to say,

Night and dome games aren't as difficult to shoot as they were in the past thanks to the advances of digital technology and reduced grain in the images using a high ISO speed. This shot was taken using ISO 2000 at 1/800 of a second with an f/2.8 aperture. ©G. Newman Lowrance/Getty Images

I didn't forget to bring those shoes the next time I was at a cold-weather game. Purchasing some type of hand warmer is also a good idea, because changing settings and memory cards and shooting in general can be major problem if your hands are cold. Without protection, your fingers can become cold quickly, so plan ahead and bring everything you need to handle any temperature.

Rain is another consideration to plan for when shooting an outdoor game. Several companies sell handy camera and lens covers to protect your equipment from becoming wet. Although some of these can be rather expensive, you need to remember the investment of your equipment that you're trying to protect. At a minimum, keep a plastic trash bag in your camera bag in case you get caught in a sudden storm. Also, bring a rain cover or a waterproofed jacket to keep you dry. During the days of using film, nothing was worse than trying to change your film canister and attempting to keep it dry as you loaded it into your camera. At least now with the digital cameras, you can use the high-capacity compact flash cards that you might only need to change a few times during the game.

Super Bowl XLI in Miami between Chicago and Indianapolis was a perfect example of tough, rainy conditions. I had several images that were basically unusable due to the condensation building up on my lens while the game was in progress. Although I had a rain cover on the lens, I still had to wipe off my lens between most plays because the swirling wind blew the moisture directly onto the front element of my lens, causing several images to appear soft and blurry. Even the wide-angle lens that I had placed in my waist bag wasn't working by the end of the game, and when I went to shoot the post-game celebration, I was forced to use a longer lens, which didn't quite capture the intent that I was looking for.

The bottom line here is to hope for the best and prepare for the worst. On the plus side, shooting in the rain can lead to some really interesting images. Because many games today are played in domes or on artificial turf, you don't get near as many opportunities as you used to for those classic "mud games" reflecting the elements. So when you do get the opportunity to photograph in these conditions, try to enjoy the results of what a rainy situation can bring.

Rain is probably the least favorite weather condition for photographers. That's because of the required frequent checking of your camera gear to make sure your lens isn't covered with water spots. ©G. Newman Lowrance

Lighting

Lighting is another important element to consider when deciding your positioning on the field. Although you can't control lighting, you can plan accordingly. Shooters tend to start a day game from the frontlit side. In that case, the sun is behind you, and the light is on the players' faces as they come toward you. Conversely, if you find yourself on what is known as the backlit side, you will be faced with a completely different lighting situation: the sunlight faces you but is *behind* the players.

Here's an example of a backlit photo. The stands in the background are in the shade, but you can still see the player's face because the shot was taken with the correct exposure. ©G. Newman Lowrance/ WireImage

If you're shooting with the camera's basic automatic features, such as a program mode, some images might come out underexposed or show too much motion blur. For this reason, I often shoot manually and use a light meter. Many photographers don't use light meters now that they're using digital cameras, but I still like to know what the overall ambient light is under most circumstances. Maybe I'm old-school, but the light meter is a safety tool that I use regardless of the lighting situation I'm shooting in.

Some photographers prefer to be on the backlit side anyway, because it offers some advantages. Since most shooters are generally on the frontlit side, you might have more room on the backlit side to maneuver and not have to go through as much finagling to get into position. Backlit images also have a completely different look from frontlit ones. In some ways, shooting backlit provides an advantage during a high-contrast day, because from the front side, the high-contrast lighting presents shadows under the players' helmets and face masks. Depending on the backlit conditions, you might need to open your exposure as much as two f-stops. This offsets the direct impact that the sunlight has, because

Notice this lighting situation. The players are in the sun, but the background is in the shade, giving a nice separation of light. ©G. Newman Lowrance/WireImage

the light source is facing you. If you're shooting aperture or shutter priority, be sure to add compensation accordingly to your settings, or your images could be underexposed. My approach is to manually set the aperture and shutter speeds, because the exposure doesn't change much in backlit conditions. Also, this back-light can fool in-camera light meters when you're shooting automatically. Even a slight underexposure in backlight can lead to additional post-processing and perhaps unusable images, so be careful about setting correct exposures.

I often shoot backlit toward the end of the afternoon when the sun is lower and shadows start to move across the field. I do this because the frontlit side becomes more difficult to shoot as players move from full sunlight to full shadow, and vice versa. Another tricky situation occurs when the players are in the shade, but the stadium background behind them is in full sunlight. Under these conditions, you will need to adjust your exposures, or the players will be underexposed because of the light from the background. This is when I prefer to go around and shoot from the backlit side, because it offers a completely different lighting environment. At this point, the background is shaded, and the backlight creates a beautiful separation between the players on the field and the darker background of the stands.

Positioning

There are many perspectives in which to shoot football. Your positioning on the field is usually dictated by what you want to photograph and what the situation of the game is. Because of this, you always have decisions to make during the course of a game. While at your position, you typically have the option to kneel or stand as you shoot. On most occasions, I prefer to kneel, because I like the perspective of looking up a bit at the players. That positioning also puts me on the same level as the players when they're tackled. In addition, I've found that it's easier while kneeling to switch from a long lens to a wide one when a play comes close. If I'm standing in this same scenario, I have to hold or lean the long lens against me while attempting to grab the other body with the shorter lens.

From the Sidelines

Photographers move all over the field from various positions when covering a football game. When you're on the sidelines beside the bench areas, watch for several situations. For instance, if you want to capture the quarterback attempting to pass or handing off, it's usually better to be a few yards behind the line of scrimmage. Regardless of which side of the field you're on and whether the player is left- or right-handed, he might or might not turn toward you as he throws the

The sideline vantage point close to the line of scrimmage is a perfect spot to capture the quarterback dropping back or rolling out to pass.
©G. Newman Lowrance

pass. It all depends on which receiver he's throwing to, but being in this vicinity is great for getting a shot like this. This is when you can capture the typical drop-back pass attempt, but you need to be prepared for other occurrences. Sometimes a running back will stay in to protect the quarterback and block your view for a moment. On other occasions, a defensive player rushing in can get in your way, which is one reason you want to be closer to where the quarterback will throw from, not where the ball was snapped. In addition, as the quarterback drops back, be conscious of how you're framing him. If you're shooting tight, vertical images, it's easy to cut off portions of his arms or legs as he drops back and then throws the pass. Players have their own style and motion, so watch their tendencies. You might also anticipate from the quarterback's actions whether he's about to be sacked or go ahead with the throw. If he's about to be sacked, you might see the defender rushing in from his blind side; from this vantage point, you'll have a great position to see that development unfold.

Also from this position, you're in an ideal place to shoot a running back who might come right toward you on a sweep or pitch play, or perhaps a receiver going in motion or running a reverse to your side. You can still concentrate on the quarterback as he hands off and then follow the running back with the ball. For these shots, I typically use a 400-mm lens, but sometimes you might be too

Quarterback sacks are always a prime shot to capture from the sideline position. ©G. Newman Lowrance/WireImage

Capturing a running back coming toward you is another shot to look for when you're on the sidelines. ©G. Newman Lowrance

tight for full-body isolation and would be better off with a 300-mm lens, especially if the teams line up at the near-hash mark side of the field, closer to you. Just remember that you can always move downfield ahead of the line of scrimmage if you want to capture a running back from a further distance. This is often the better area to be in for those types of shots anyway. If the running back breaks free for a long run, you'll have more time to get him in full motion; otherwise, you might have only an instant before he turns up the field, past your vantage perspective. Your positioning decision will depend on what equipment you have, what subject you're intending to shoot, and how far away from the action you are.

From the sidelines, you can also capture the basics of the kicking game. For a field goal attempt, you should set up similarly to when you shot the quarterback—a few yards behind the line of scrimmage so a defender rushing in doesn't obstruct your view. Regardless of which sideline you shoot the kicker from, watch for his reaction after he has kicked the ball. His response will usually tell you immediately whether he made the kick. It's a perfect moment that can tell the story of the game.

Shooting the punter from the sideline position is similar. You can set up a few yards ahead of his starting position, knowing that he will move forward a step or two before punting the ball. This is another situation when a 400 mm might be too tight to get the player's whole body in the frame, so either shoot with a wider lens or move down the field to get a more frontal view of the punt. If you feel like the defense is going to put on a big rush in an attempt to block the punt, you can also shoot horizontally with a zoom lens such as a 70–200 mm for a wider perspective.

Another option is to capture the players returning the kickoff and punts from the sidelines, because the receiving team is usually fielding the ball in its own territory. By comparison, if you were shooting from the end zone behind the punter, obviously you would be extremely far away from the receiver and hoping for a long return. By placing yourself on the sidelines, you can shoot the kick returner catching the ball and then running and attempting to avoid the defenders. Of course, you hope the ballcarrier runs toward you, because shooting an isolation of a player as he runs away from you or runs up the opposite sideline isn't likely to make a great picture.

Obviously, if you're shooting from the sidelines and are close to the line of scrimmage, you're near the action. When you want to shoot members of the defense, you can still obtain many images from the sidelines, but you are generally reduced to capturing the players on your side of the field, because the others will often be too far away. You can shoot nice isolations of the defenders on

The elements of the kicking game: field goals, punts, and the return game are typically shot from the sideline position. ©G. Newman Lowrance

your side as they line up against the offense, as they drop in to pass coverage, or as they pursue the ballcarrier as they rush in. An exception to this is what I mentioned earlier, when a defensive end or linebacker from the opposite side rushes into the backfield area. You can then capture the player as he comes toward you in pursuit.

While you're on the sidelines close to midfield, it's worth your time to watch the activity that occurs inside the players' bench area. Depending on which unit is on the field, the other is often getting instructions from coaches or plotting strategy as they try to determine a way to beat the opposition. This is an opportune time to photograph other elements of a football game. A confrontation between coaches and officials or between teammates can show great emotion and tell part of the story of that game. When you're looking in this area, also anticipate the players and coaches watching the instant replays or glancing at the scoreboard. You can often shoot some tight headshots in these situations because you're so

Watch for shots in the players' bench area, as players and coaches alike visibly display their emotions during a game. ©G. Newman Lowrance/WireImage

close to the players. In addition, watch for the coaches to walk over to the players sitting in their respective groups. At most college and professional games, members of the offensive and defensive units sit together on the bench. This is just another opportunity for you to capture a candid sideline situation. Just remember that you're not allowed to stop behind the bench area at professional and many college games to take photographs, so do your shooting at either end of the team bench.

From the End Zones

Another great location for shooting football photos is behind the end zone, directly facing the offensive or defensive team. From the offense perspective (when you are behind the defense), the end zone gives you a nice view of the holes that the offensive line opens up for a running play or a view of the wide receivers who are running their various pass routes. If you need a photo of an interior lineman setting up to block or pulling around on a sweep, the end zone is an ideal shooting location, but it can also be tough, because other players often obstruct your view. Be on the alert; you usually have a split second to get a clear shot of a play or individual player.

You can also set up closer to the corner of the end zone for a different angle and shoot the offensive line as they set up to pass block. Often you can get a clear shot of the center as he comes to the line to point out blocking schemes. From this perspective, you can also shoot the receivers as they set up, run their route, or catch the ball, because you are already in front of them.

Of course, shooting the receivers actually making a catch can be difficult. This is when knowing the down and distance can give you a clue to the next play. If I feel the team is going to pass, I'll look at the formation and see how many receivers are split out. It helps to have an idea of how many receivers will be going out for a possible reception. Anticipation and a little luck often come into play. You can focus on one player and hope he is the intended receiver, or you can try to follow the action and react to the pass. If you see the receiver leaping up, anticipate when the ball is going to be there, and shoot accordingly.

Another end zone advantage is that the majority of the action is in front of you, regardless of which side the play goes to. Also, you won't have to deal with the chain gang crew, the ball boys, and all the various sideline obstructions. Remember: anytime you can have an unrestricted viewing position, you're at an advantage. If you find that you're dodging the sideline microphone or officials and timekeepers, your shooting abilities are obviously restricted. From this end zone perspective, you usually need the longest lens that you have, especially if the line of scrimmage is 40 or more yards away from where you're positioned. You'll find

Shooting from the end zone while facing the offensive team can be advantageous when big plays occur downfield. ©G. Newman Lowrance
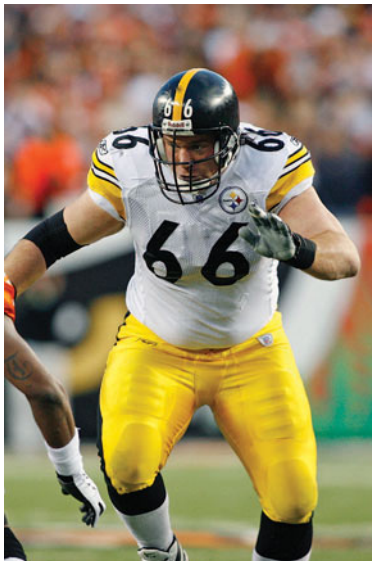
You can also look for isolations of offensive players from the end zone location. ©G. Newman Lowrance

Having a zoom lens near the goal line is a great way to capture a big play. Here, I capture a touchdown as a player leaps into the end zone.
©G. Newman Lowrance/WireImage

yourself in a superb position if the quarterback launches a deep pass downfield or a running back breaks free for a long gain. In either case, if you're on the sidelines at the line of scrimmage instead of this end zone position, your vantage point for these types of plays will most likely be at a disadvantage.

When the offensive team gets close to the goal line, be prepared to use a lens such as a 70–200 mm or even shorter, such as a 28–70 mm. You never know where a play is going to go, so you need to be prepared for any situation. Most photographers carry at least two cameras so they're prepared for various plays. Having another camera and lens can be useful in these instances. For example, if you're keying on the quarterback with a long lens and he suddenly looks in your direction, be prepared to switch to a wider lens for a play that could occur directly in front of you. If you don't make the switch in time, you might miss a great opportunity to capture the receiver catching the ball for a touchdown or a defensive back making an interception or batting down the pass.

One disadvantage of shooting from the end zone is that the linemen usually block the action behind the line of scrimmage opposite you. For instance, if you're shooting the offense as they come toward you, it's doubtful you'll be in the ideal position for a fumble or tackle when it happens behind the line of scrimmage. However, because most big plays are from the offensive standpoint, odds are you'll capture many big plays and action shots from the end zone. Breakaway runs and long passes are far more frequent than fumbles or interception returns for a touchdown.

You can capture the defensive side of the ball using this same end zone position. Facing the defense, you can shoot the defensive linemen rushing around the offensive linemen and sacking the quarterback or stuffing a run in the backfield. In addition, you can watch for a linebacker pursuing a ballcarrier, a defensive back peering into a receiver's eyes before the snap, or a player returning an interception or fumble. Another situation to capture from this perspective is a team attempting to block a field goal. Capturing the defensive players leaping up to block a game-winning kick can definitely reflect the intensity of the moment.

Regardless of your shooting location, the basic element is this: you can only capture the action that happens in front of you. With 22 players on a large field and diverse action, you won't capture every big play, and you can't worry about what you miss. Sometimes you'll be focusing on a certain player to get an isolation shot and miss a big play. In other instances, your positioning isn't the best angle for what takes place. But by being prepared and anticipating the various situations that arise, you should have many opportunities to get plenty of good shots. If you can continually capture the action that takes place in front of you, you'll be successful more times than not.

Here is another example of using a zoom lens from behind the end zone—this time vertically while capturing a great catch for a touchdown.
©G. Newman Lowrance

Facing the defense from the end zone position, you can concentrate on several different aspects of the game, such as isolation images of individuals, sacks in the backfield, or even field goal attempts.
©G. Newman Lowrance/WireImage

Shooting Methods

Photographers use various styles while shooting a football game depending on their situation. Newspaper and wire service shooters generally try to capture the big plays or important scores for a journalistic-type approach. They attempt to capture images to use editorially for the next day's publication. These images might include an injury or a player showing emotion, both of which tell a story. In contrast, most team photographers position themselves so they can shoot players just of that particular team, without covering the opponent. They are only concerned with images that the team needs for its own use. Another situation is when a photographer works for a magazine that is preparing to write a story on an individual player or team. In that case, the shooter might follow a player or certain players for the entire game to correlate with the writer's story.

Obviously, if you're just starting out by shooting youth or high school football, or you're getting your first taste of shooting football at the college level, you should be set on learning everything you can. Experiment with the various positions on the field and different camera settings while you learn what to look for action wise. Hopefully this book will give you a few tips to do that, because shooting in this manner can be a valuable learning experience. Most professionals had to start at this point and improve their skills along the way. You can do the same. Just shoot the action freely as it unfolds in front of you, and learn from your mistakes. Shooting at these youth or high school levels can bring a lot of freedom, so enjoy it.

There are also commercial and other editorial usages for professional football images. Trading card companies, such as Topps and Upper Deck, and annual publications, like *Athlon Sports* and *Lindy's,* typically publish individual shots of players in action. Photofile is a company that sells 8×10 images of players; it steers photographers toward capturing isolated images of players. Another alternative is a relatively new company, Fathead, which produces life-size images for display. For most of these usages, you would shoot almost everything vertically, because most trading cards and stock images are used in that respect. Editors for these usages typically seek isolated shots of players in great lighting conditions. That's why many of these images are shot at the start of the season during day games, when the light is good and daylight savings hasn't begun. However, with the latest improvements in digital cameras, even images from night games are starting to appear for these purposes, especially during preseason games when it might be rare to photograph a rookie or backup player actually playing. As a sports photographer, try to acquire as many marketable images as you can.

Images that tell a story or show an important score are great for journalistic-type usages such as newspapers or magazines.
©G. Newman Lowrance

Annual publications generally prefer vertical, isolated images of players for their usage. *Street & Smith's* magazine eventually ran this image for one of its covers. ©G. Newman Lowrance

This photograph is an example of an isolated image that Fathead used commercially for one of its life-size products. ©G. Newman Lowrance

Before the Game

All of what I've explained so far has dealt with shooting the actual game action. However, further elements of a football game can lead to publication-worthy images. You can usually capture some nice isolated images before the game during the teams' warm-up rituals. This could include the quarterbacks throwing on the sidelines and the receivers and backs catching the ball. Another element to look for is the players lining up together as a team to stretch. Many of the players take off their helmets during the stretch, providing a nice occasion for some head shots. In addition, each unit of every team prepares for the game in its own area. That's a perfect time to photograph the coaches on the field, because during the game, they're sometimes difficult to capture considering your positioning on the sidelines. The coaches might be conversing with the opposing head coach or firing up their players as they prepare. Be sure to catch these types of moments, because you never know when someone will request them.

The college environment often offers interesting shots of the student sections.
©G. Newman Lowrance/Getty Images

Sideline activities are another element in football that you should photograph. Annual football publications and Web sites frequently use images of mascots and cheerleaders. ©G. Newman Lowrance

As game time approaches, the intensity from the fans and players rises. This intensity is yet another item you can capture. ©G. Newman Lowrance

As the players prepare for the game, look for quiet, isolated moments. ©G. Newman Lowrance/WireImage

Depending on the situation that you're shooting, you can also look for various elements of the crowd and sidelines that make up the event. A college game is an excellent scenario for many of these situations. You can capture the student section, cheerleaders, mascots, and various other entities that reflect the total game experience. Annual publications and various Web sites typically use shots of these elements, so be aware of these aspects as you try to take in the whole environment.

Another football ritual prior to kickoff is the announcement of the starting line-ups as the players run out of the tunnel or locker room and onto the field. Following that, the teams usually huddle together as a unit for a final pep talk by a coach or team captain. When I have the clearance to shoot these aspects on the field or up close, I can definitely see and feel the players' intensity and anticipation. Remember, photographers don't just freeze a moment in time; they attempt to capture the feeling from any given moment. As game time approaches, consider these aspects and similar situations to capture the players' intensity and excitement.

Following the Game

As the clock is winding down, you can prepare for even more photo opportunities immediately following the game. If you want to capture the post-game handshake and head coaches, be aware of where they are as all the players and coaches leave the sidelines and join each other on the field. With so many players, it's easy to lose sight of the coaches and star players that you might want to shoot. Stay close to the bench, and follow the players and coaches as they leave the sideline area. Bear in mind that plenty of other photographers are attempting to get the same shot, so prepare to hustle to get a good position!

Other players will mingle together and perhaps pose for you with a player from the opposing team. Some will go to the middle of the field for a final prayer. On top of that, television reporters are usually conducting interviews with a player who had a big game or made the winning score, so keep your eyes open as you make your way through the team. Finally, you can watch for players who wave to the crowd or celebrate as they walk off the field.

Following the game, you have several additional photo opportunities, such as the head coach's post-game handshake, and players mingling, being interviewed, and perhaps celebrating.
©G. Newman Lowrance

Gallery
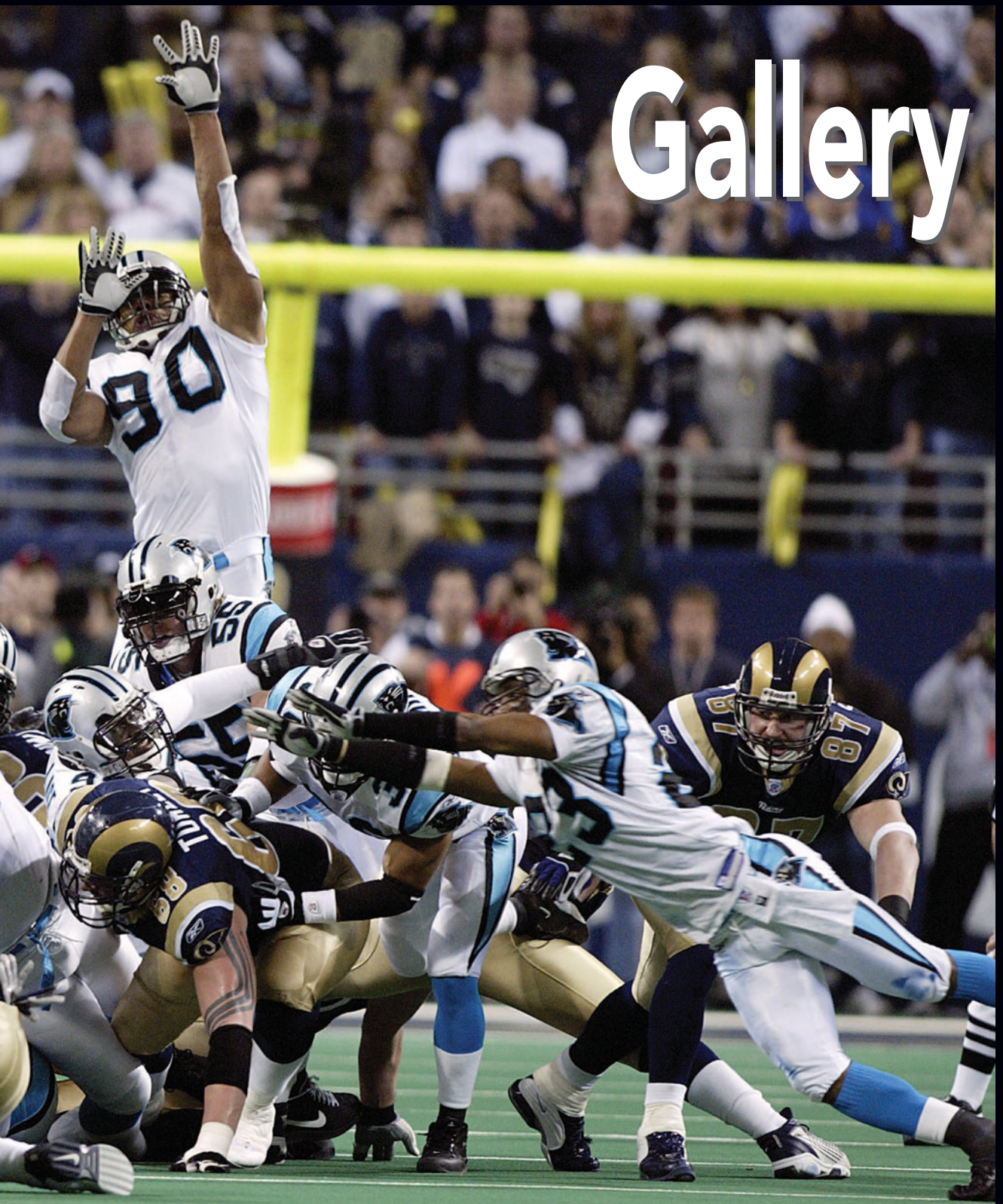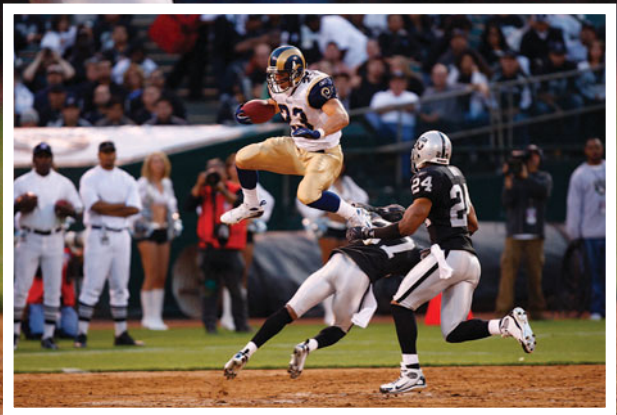
Basketball

by Andy Hayt

CHAPTER

7

Played indoors in a confined space, basketball is unlike any other sport to photograph. The players run full speed up and down the court and wear only simple uniforms with no padding or helmets. Action can be continuous for several minutes, making the sport a true test of the photographer's skills. Basketball is a fast-paced game, and the obstacles of shooting within a confined space add to the challenge. Shooting basketball combines the technical difficulties of indoor arena photography with the skill needed to shoot quick action.

Loving and Learning the Game

During my professional career, I have had the pleasure of working for such newspapers as the *Arizona Republic* and the *Los Angeles Times*. I was a staff photographer for *Sports Illustrated* for 11 years and have worked for 10 years as a photographer for the National Basketball Association (NBA). I have been fortunate to cover NBA Finals games for more than 25 years, in addition to numerous NCAA Final Four championships. Along this journey, I have shot everything from Magic Johnson's rookie season to Michael Jordan's last game as a Chicago Bull. This work has allowed me to have access to many interesting characters, including the athletes, coaches, referees, and fans of the game. Because of the small squads and long seasons, basketball teams become a tight-knit family. When you are let into their world, you get to see some special moments.

Many people comment that I must have a love of playing basketball to enjoy spending so much time photographing it all these years. Truth be told, I am probably one of the least coordinated people to ever set foot on a basketball court. Throw me the ball and watch me duck. So how did I come to enjoy photographing this sport while getting the incredible opportunity to have the best seat in the house for two decades? It is really quite simple. I have always enjoyed the game, but I am more passionate about photography. Distancing myself from being a fan has allowed me to become a true observer. My love of the game has never clouded my ability to see it as it is really being played on the floor, regardless of who is winning the game. This has given me an advantage in figuring out what is going to happen in the game based on watching what was happening on the floor.

One of the first times I ever photographed basketball was for my high school yearbook. Unlike shooting outdoor sports, this presented a whole new set of problems. How was I going to stop this fast-paced game in a high school gym building? What film would work? Where should I stand, and what makes a good basketball photo? Thirty-some years later, I can say I have figured out some of

how to photograph this game. The more I shoot basketball, the more amazed I am by what the talent on the floor is doing. By learning to photograph basketball, you get an entirely different view of the game. Shooting this sport requires that you understand how the game is played, not only from a rules standpoint, but from what each player is capable of doing on the court at different times.

For a photographer, the ability to shoot basketball is not just limited to the professional game. Every night in every city and town in the U.S., some team is playing from October through March. Whether you are shooting junior high school or pro basketball, the game is universally the same with the exception of a few nuances. This provides an excellent opportunity to photograph the sport on any given day.

Telling a Story

One of the best techniques I have encountered for shooting any sport is to use a photojournalistic approach to each game or assignment. This involves telling a story with pictures. To tell a good picture story, you should start with the idea that every event has a beginning, middle, and end. Although this idea is simple in concept, you can expand it to include an establishing shot of where the event is taking place; the characters—or, in this case, the athletes involved at the start of the event; gameplay; the pivotal winning moment; the celebration of victory; and the reaction and display of emotion in defeat. Essentially, you are telling a story the same way that someone makes a movie. So how does this help you shoot a basketball game?

Sports events are dramas with both winners and losers; each outcome is decided by the way that individuals and teams react. The goal is to create the most interesting and telling sports photos from a given event. Sometimes this means that you might tell the story not just by shooting the pretty, spectacular layup or dunk. Sometimes you might shoot the defender stealing the ball with three seconds left on the clock in a tie game and making the winning basket. It is important to realize in any sport that you can shoot the individual player and how he interacts with his teammates or the game, or you can shoot the entire team within the context of the event.

Someone passed on this information to me early in my career, and it gave me a way of viewing each event in a dispassionate state of mind. It allowed me to look at and analyze what was happening during the game not from the emotional viewpoint of a fan, but as a neutral party who could discern what was happening and be ready for key moments before they took place.

Telling a good story with your pictures is essential in sports photography. Here, the emotion tells it all.
©Andy Hayt/NBAE

Emotion can also be shown from an individual
player, even from behind, as is the case here.
©Andy Hayt/NBAE

Basketball from the Photographer's Point of View

When you are working indoors in a small, defined space, it becomes critical to realize the many different angles you can shoot from. Think of the floor as the space in which the talent will move around, and look at what each area of the floor brings to view from your camera's viewfinder. Ask yourself questions. Will this shot give me a view of the defender, the shooter? The players, the scoreboard, or the benches? Will the referees on a key play block me? Sometimes the arenas have courts that have great logos when photographed from a high viewpoint.

Location

To start photographing basketball, it is best to go to the spot just to the right side of the basket on the floor. You can find this spot by standing behind the basket and going to your right side. Sit approximately five feet off to the side of the basket standard, making sure that you leave plenty of room for a safe run-out lane for the players driving up under the basket. This gives you the angle with a "normal" or 50-mm lens on 35-mm film or digital cameras to shoot the classic layup, or in the key shots that are a high percentage. From my experience of covering the game, you can even prefocus your lens to 17 feet and then concentrate on just figuring out when to shoot the action when it comes into the basket or painted area in front of the basket. You can shoot players driving the ball and bringing the ball toward you into the corner of the floor off to your right side.

I strongly suggest going to this spot to the right of the basket first, simply because you begin to understand the speed and movement of how a player jumps with the ball. Shooting this action at its peak requires you to time when the movement is at the peak, when the shooter is ready to release the ball from his fingertips. It can be frustrating at first to get your timing down, but remember this: some people have been doing this for decades and still cannot hit the peak moment every time. The best thing to do is relax and wait for the action to come to you.

I do not keep my eye up to the camera during the whole game. I take my eyes off the camera and watch and wait for things to start to happen. This keeps my eyes fresh and sharp when they are up to the camera. Think of how difficult it is to concentrate intensely on one single thought for several minutes. Now, how do you think you are able to do this using your eyes for extended periods of time

while concentrating on a fast-moving subject? It is not going to happen, so the best thing to do is relax and shoot only when necessary. Save your eyes for when activity is near you. Take timeouts and think about what you are seeing. Is the star player having a great game, or is the defense or a specific player shutting him down?

After you have shot from this position for several games and can judge the speed and action of the player, take a step back and analyze your results. From every photo that I have taken in my career, I can find information that tells me how to do it better the next time. The improvement can involve poor framing, ugly backgrounds, missed focus, and late or early action.

Analyzing the Pros

Now that the game has sparked your curiosity, it helps to do a little research. This is a good time to visit your local bookstore or library and start analyzing what the professionals are doing to make such spectacular photographs. Books, magazines, newspapers, and even trading cards provide a variety of great basketball photographs. Ask yourself: where is the photographer on the floor? What lens is he shooting with? How did he get that angle, and why was he looking for that shot? The easiest way to figure this out is to get inside the photographer's head by analyzing his shots. I still spend a tremendous amount of time analyzing photographs to figure out what the photographer was seeing. This includes everything from environment to lighting to camera equipment. You will start to see certain angles that work well for certain situations. Then you can go out in the field and try shooting them yourself.

Film and Equipment

Now that you've gone out and discovered what photographic nightmares most gyms are for shooting pictures, it's time to address the technical side of working indoors. One of the essential formulas for achieving great pictures is to minimize variables that can hamper your success. First and foremost, know your equipment. This includes both your cameras and your lighting sources. You can use two types of light sources in indoor photography: either available light or electronic flash units that are commonly referred to as strobes.

Sitting to just the right side of the basket can be a great location. It is an ideal place to start when you are photographing basketball.
©Andy Hayt/NBAE

When photographing a sport, don't limit yourself to the game action. Great close-up or detail photography can also create great images.
©Andy Hayt/NBAE

Becoming aware of other photographers' techniques is a good way to learn the trade. Pay attention to where other photographers are located and what lenses they are shooting with.
©Andy Hayt/NBAE

Shooting with Available Light

Shooting with the available light in an arena requires the use of fast lenses that have a maximum aperture of f/2.8. You need to shoot high-speed color negative film of either ISO 800 or ISO 1600. If you're shooting digital, set your camera between ISO 800 and ISO 1600 depending on how bright the lighting is. It goes without saying that working at these high ISOs leaves little room for errors in focus and exposure. You are operating at the end of the spectrum for achieving quality photographs. That's why it's essential that you realize that these two variables are extremely critical in achieving success with your photographs. If you miscalculate either one, you will achieve poor results. That's why I'm always careful with metering the exposure of the available light in a building before I start shooting. Most in-camera meters are extremely accurate in reading the exposure, but it's critical to know where to take your reading. I suggest that you find someone with a midtone, gray, tan, or midrange-color shirt and have him move around the floor and meter the different spots where you will be shooting your pictures. As a rule, the bench area is one-half to one f-stop darker in exposure than the floor. If you are shooting from under the basket, the exposure is generally the same from midcourt to all the way around your half of the floor. When you shoot toward the opposite end, the exposure is usually one-half an f-stop less than where you are sitting. In most gyms, the overhead lights are focused over the floor and bleed down in intensity as they fall off into the benches and stands.

When shooting available light, I like to have a minimum shutter speed of at least 1/640 of a second to stop the action. You can sometimes stop movement at its peak at 1/250 of a second; however, it tends to blur feet, hands, or fast movement. Sometimes you can stop action at midcourt at 1/250, but it is risky at best.

I don't advocate using auto-focus when you have lenses of 50 mm or less. It is better to manually focus the lens, because most short, focal-length auto-focus lenses pick the wrong object to focus on in the foreground or background. The short, focal-length lenses have a tendency not to lock in on fast-moving objects.

Strobe Lighting

When a gym is just too dark to get an exposure of at least 1/250 at f/2.8 at ISO 1600, it's time to use strobe lighting. When you're using an on-camera flash, it's best to shoot near the basket, because most on-camera strobes carry light only to about 20 feet. I suggest using ISO 200 speed film or ISO 200 in the digital format. This allows you to shoot at 1/250 of a second at around f/5.6 depending on the power of the strobe unit.

Manufacturers rate strobe units by watts/second for advertising purposes. This is a measurement of electrical energy that only perceptually indicates how much light a particular unit might produce. Actual measurement of light output with a light meter that is capable of measuring flash output is the appropriate way to determine if a strobe is capable of producing a usable exposure. Generally speaking, the lower the number of watts/second, the less power in the strobe.

Strobes mounted up high in arenas allow shooting with a lower ISO speed. ©Andy Hayt/NBAE

When you're shooting with a strobe, remember that it is the duration of the flash that stops the movement, not so much your camera shutter speed. If you happen to go below 1/250 of a second, you might get a blurring or movement effect called *ghosting*. Although this can be an interesting effect, it is not desirable when you are trying to shoot a peak action shot.

While working at *Sports Illustrated*, I was able to work with high-powered, large strobe units mounted up in the ceiling of the arena. We turned the building into our own photo studio by placing four high-powered 2400 watt/second Speedotron strobes in the catwalk or ceiling of each building. We placed the strobes in each corner of the catwalk just behind the baseline of the court and aimed toward the paint at each basket. Then we wired the strobes together and triggered them off a drooped electrical line from the catwalk to the floor that was tied off at the backboard standard. This allowed me to shoot slow ISO 100 speed transparency film at 1/500 or 1/250 of a second at f/4-5.6 anywhere on the floor of the arena.

These types of setups are extremely time consuming and expensive to set up. All the NBA games that I shoot are on these same strobe systems. Most major arenas in the U.S. now have strobe lights permanently installed for the team photographer and visiting magazine and league photographers. Using these high-powered strobes allows the photographer to experiment with formats other than 35-mm cameras. The most popular camera to use is the Hasselblad 553 ELX for under-the-basket photos and a 300-mm f/2.8 or 400-mm f/2.8 lens on a 35-mm camera body for down-court shots. See Chapter 8, "Hockey," for a detailed description of strobe lighting.

Choosing a Camera

When you're choosing a camera for sports photography, be aware that the most important feature to look for is good-quality glass in the lenses. Many people ask me about one brand of equipment over another and which features are important in helping to take good photographs. With all of the new technology regarding motor drives, digital file sizes, and auto-focus, the feature most often neglected is optical quality. If the image is not razor sharp with optimum color quality, all the other features become worthless. Consult with those who are in the field, and possibly view such Web sites as http://www.sportsshooter.com, http://www.dpreview.com/, and http://www.robgalbraith.com/bins/index.asp for resources about optics that work well at maximum apertures of f/2.8 or lower. These Web sites are also a great place to learn what the pros say about all the new equipment as it hits the market. I was fortunate to grow up using

cameras that had good optics. Several times in my career, I was exposed to lesser-quality optics from off-brand camera companies. It taught me to stay away from off brands or secondary brands that were not built by the camera body manufacturer. The goal is to omit the variables that will hurt image quality and lower your success rate of in-focus and well-exposed images.

The two most popular brands that professional photographers use are Canon and Nikon. Each has distinct differences in its operating system and user friendliness. Each builds a quality digital and film camera that gives you high-quality images. I would suggest only using a camera that has an auto winder or motor drive. This is not so much for shooting bursts and sequences, but rather so that you can keep the camera up to your face without having to wind it manually. Also, the current motor drives and accessory grips have vertical shutter buttons that make holding the camera much more comfortable when you are shooting vertical photos.

Choosing Lenses

When you're choosing lenses for shooting basketball, it's best to start with a 50-mm lens. You mostly use this lens for basketball, boxing, and football. It's the best lens to use when you're first going out and shooting the game. Most photographers add a midrange zoom lens of 70–210 mm or 80–200 mm that has an aperture of f/2.8 as their next lens. This lens allows you to move around the court and shoot action at midcourt, down-court, or right in front of you. The next lenses that most photographers add are a 28–70-mm zoom, a 300-mm f/2.8, and a 16–35-mm zoom. Also, be aware that the NBA requires that photographers use soft rubber lens shades on all lenses that are utilized around the playing floor, including remote cameras. This is a good idea at any game because it protects the players from the sharp edges of metal lens shades if they run into you.

When you start adding these lenses into the mix, it is time to include a second camera body to your equipment list. This allows you to shoot toward both ends of the floor without having to constantly change lenses on a single body and miss pictures in the process. Several of the professional photographers who work shooting NCAA and NBA basketball for large publications or the leagues carry anywhere from 4 to 15 cameras to most games. Although this number of cameras might seem outrageous to someone who is starting out shooting basketball, the majority of the cameras are mounted on brackets in fixed strategic locations throughout the arena and operated remotely.

Using remotes can enable you to shoot from several different vantage points.
©Andy Hayt/NBAE

Shooting the Game

Whether you are shooting a junior high game, a high school girls' game, college, or NBA basketball, all the venues have several common opportunities. The first and foremost is to tell a story. Whether the story is about a team or an individual, each one has certain parts of each game in common. However, before you can tell the story of the game, you need to be prepared both mentally and physically. That includes having all your camera gear ready for use.

Preparation

Typical preparation includes making sure all your batteries are fully charged, you have brought enough film or compact flash cards, and you have a cushion to sit on. (The court doesn't get any softer during the game.) The cushion might sound like a funny thing to bring, but look at the pros that cover the game, and you will see an interesting group of cushions and folding camping chairs. Sitting cross-legged on a wooden floor for two to three hours can cripple you. I always use a folding luggage cart to haul my gear around, and I never leave home without my seat cushion.

I usually get to a game a minimum of two or three hours before tip-off. This gives me ample time to set up my cameras, find a spot to shoot from on the floor, and measure the available or strobe light exposure. Many photographers arrive late and struggle to get ready. Almost every pro I know arrives early, sets up, and then can relax, visit with friends, watch or shoot warm-ups, visit with players, or catch moments behind the scenes. This extra time gives me a peace of mind that allows me to really think carefully about the upcoming game and how I'm going to shoot it rather than worrying about where I'm going to sit for the evening.

Behind the Scenes

One of the best opportunities in covering basketball is to shoot what goes on with the team behind the scenes. Developing a relationship with a coach and media relations staff who trusts your abilities not to disrupt the game planning can provide you with access to what goes on before the players hit the floor. This access gives you a look into a private world that you normally have no access to. The private moments and intensity in these photos can sometimes be more revealing than what takes place on the floor. They set up the story of the game and often impact the game's outcome. If you do not have this access and are developing a relationship with a team, realize that this takes both time and trust. Shoot out in the tunnels rather than the locker area when the team is ready to hit the floor.

Developing good relationships can sometimes allow you greater access to teams. ©Andy Hayt

Most teams have a private huddle before they hit the floor. Try shooting it with available light or with a hand strobe without interfering in the team's moment of togetherness.

Be discreet and unobtrusive, and you will get great images. Don't make yourself bigger than what is going on with the athletes. You are there to witness and photograph and not interfere with the event. I opt to pass up shooting a moment if it disrupts a player's routine or interferes with his preparation for the game. I always tell people to imagine someone coming to their office and getting up on their desk to photograph them while they work. Most people wouldn't like that.

Before the Game

The warm-up and shoot-around period before the game is a great time to watch teams come out and loosen up. Usually, you can learn which plays a specific shooter is going to run during the game. There's a reason it's called practice, so watch the players run their plays and then see them in the game later on. I

The warm-up session prior to the game
can provide photo opportunities.
©Andy Hayt/NBAE

cannot tell you how many times I have watched photographers get stumped by what a specific player is going to do or where he likes to shoot from on the floor. This rule applies to almost all sports. Watch the warm-up, and see what the players and individuals like to do. It's not rocket science. Athletes have a tendency to naturally shoot the ball or move in certain ways on the floor. They repeat their moves over and over. Michael Jordan liked to dunk to the left side more often than not. This isn't guesswork. His most spectacular plays always went from right to left. Watch and learn, and before you know it, you'll see the move right as it's about to happen. You won't be reacting after the fact.

The Basics of Journalism

First and foremost, set the scene. Show where the game is being played, and give the viewer an idea of the basics of journalism: who, what, when, where, and how. Usually, I wait until a point in the game where I can slip away to find a shot that somehow encompasses the mood of the inside of the building, showing the game in progress, the players running on the floor, or rabid fans getting behind their team. Often, one of these shots suffices to let the viewer know what is going on in the arena. This sounds basic, but shooting this picture and having it evoke emotion and provide quality information is not always easy. Use the lighting in the arena to create mood. You can see an example of this in arenas where the stands have darker light than the floor. Using fans in silhouette in the foreground can give mood to a shot.

Always look for moments away from the action or during time-outs. Look at how players interact with the coaches and referees. An enormous amount of activity occurs during a game that can tell you more about an individual or a team than any action shot.

Ready for Action

Be ready for the tip-off, check your camera settings, and then be ready for the action when the ball is tipped. I also make sure that all my camera settings are locked or taped down so that they don't get bumped during the games, because I'm continually picking them up and putting them down. The tip-off shot is usually not that important, except during a finals game. It is fairly mundane and routine. However, you can try making an interesting shot of the tip-off if you get clearance to shoot from an extremely high overhead position or a catwalk in the ceiling. This is a nice shot if you can capture every player on both teams looking up at you with the floor logo at center court. Your exposure for this shot is no different from your floor-level exposure. You usually take this shot with a 200-mm to 300-mm lens.

Players often interact with referees and vice versa. Be sure to capture these moments in addition to the game action. ©Andy Hayt/NBAE

Coaches sharing a moment with players can be another important element that you can look for while shooting basketball. ©Andy Hayt/NBAE

When the game is under way, try to shoot the peak of action, whether it is on offense or defense. Many people shoot too tight on the player and lose the wonderful relationship of how high in the air the athlete is compared to the floor. When the shooter is coming at you on the floor, the tendency is to shoot as soon as he takes the first step up off the floor. The hardest part of timing peak action is waiting to shoot right after both feet have left the floor. After many years of shooting, you get a sense of when to pull the trigger. It is all about practice, so don't expect to get it down the first few times you shoot.

When shooting down-court on defense plays, try to keep your focus on the defender who is facing you and not necessarily on the back of the ball handler. There is usually a point when both players hit the same plane of focus. This is when you want to look for your shot. Watch the player's hands, and be ready for them to go up to the basket for the shot or the block. The shot can look

Moments between players away from the action or during time-outs can warrant great interaction.
©Andy Hayt/NBAE

spectacular if you have two big men, fully extended, going up against each other. The same can be said for guards going for a steal or forwards who are trying to block an inside pass. Most of the shots toward the opposite end of the court look best taken with a 300-mm lens.

By moving off court and shooting from the grandstands, you can come up with some interesting angles. Try shooting from the side in line with the baseline at basket height. An aperture setting of f/2.8 with a 70–200-mm zoom lens creates good isolation on the shooter by throwing the background out of focus. This can be particularly effective if you have a team that plays in the paint. It looks great with almost all the players on the floor. Note, however, that shooting the same way every game becomes both static and visually boring. Mix it up, use different lenses, and try different angles and shooting positions.

When you're shooting the game, don't neglect the bench, both from a close angle during time-outs and with longer lenses during the game. Just remember that photography is not allowed behind the bench during an NBA game. Floor security moves you away from that area if you attempt to shoot there. If you are shooting in a less restrictive league, make sure that you have the permission of the team or the league to shoot around the bench, especially during time-outs. Also ensure that floor security knows it is okay for you to be there. Watch for reactions from coaches and key players. Unfortunately, the benchwarmers have a tendency to jump up and down, but don't pass up a good shot just because the player doesn't start. This helps build the feel and emotion during the game.

When you're covering an assignment in which you have to shoot just one individual, it's easier to shoot the entire game as you normally would as it takes place on the floor. When you focus on just one individual during the entire time, you don't get into the flow of the game, and you usually freeze up when your player touches the ball. Allow yourself to shoot great shots regardless of who it is. That strategy gives you a mental boost to be hitting shots consistently rather than just waiting and getting frustrated when you don't react quickly.

Remotes for Basketball

At this time, I would like to add a thought for people who are interested in covering a game with cameras in a fixed, mounted position. These cameras are referred to as remotes. Setting up remotes requires safety cables, black gaffers tape, a magic arm attached to a photo-clamp, and a remote trigger radio or hard-wire trigger. You can secure cameras to the basket stanchions, the arms of the backboard, guard rails in the stands, or overhead catwalks.

You don't always have to be on the floor to capture a great basketball image. Try different positions for different results.
©Andy Hayt/NBAE

Here is another example of shooting from off the floor. Shooting from the stands can provide some interesting angles. ©Andy Hayt/NBAE

Capturing the intensity from the bench area of a key player is always a good element to look for. ©Andy Hayt/NBAE

Always observe and look for reactions from the bench, because you never know what you might see! ©Andy Hayt/NBAE

The most important thing to remember when doing any of these setups is safety first. Never mount a camera where it can fall and hit someone. Always use proper safety cables to secure remote cameras. Doing so not only protects the fans and players, but it also prevents a camera from taking a long fall if a clamp loosens from vibration during the game. It's better to have a game delayed to remove a loose camera than to deal with an injured fan or player. You might find yourself in court with a hefty lawsuit or worse, so be careful in your setups and camera placement.

Also, make sure that you have the approval to place a camera anytime it is within the field of play of the game so that an uninformed referee or coach doesn't ask you to remove it. Finally, inform public relations staff of remote camera placement so that you have their approval and they acknowledge the use of these cameras. Make sure your remotes are not going to fall and hurt someone, interfere with the game, or block the view of a fan.

The Final Minutes

After you have gotten into the final minutes of the game, it is important to look for the game-winning shot if it is a close game. Most pro and college arenas have a scoreboard behind each basket. If the winning shot happens to occur at the opposite end of the floor, shoot loose with an 85-mm lens and get the winning shot and then all the players on the floor with the shot clock and final score showing in one frame. If the winning basket is in front of you, don't shoot so tight that you throw the crowd out of focus. Allow the crowd to react and help define the moment. Be ready for bedlam if it is a close game or an upset.

Reaction shots can be extremely powerful at the end of a game. You can rush the floor and shoot the winning team celebrating or look for the dejection shot of the losing squad. I personally prefer to shoot these moments from an angle several rows up in the stands where I don't become part of the activities on the floor. I get cleaner and different angles than what I get by just shooting with a wide lens on the floor. However, please experiment and try any of these.

After the game ends, watch for players reacting with family, friends, or teammates. This can be an opportune time to shoot the team in a celebratory moment in the locker room. Again, shoot the moment, but don't hinder the participants or infuse your presence into the team's moment of triumph or defeat.

After your have shot the game and all that it encompasses, take the time to edit your images and learn from your mistakes. Rarely do we learn from success, other than how to repeat the same moment again. Our mistakes hold the key to improvement in technique and content. You can usually pick out several ways to improve your images, which you can use the next time you hit the floor.

Shooting moments after the game can also provide you with some great images. ©Andy Hayt/NBAE

Hockey

by Jonathan Hayt

CHAPTER

8

Combine the grace of basketball, the hard hits of football, the endurance of soccer, and the skill of tennis, and you have the game of ice hockey. Played on indoor ice rinks and covering approximately 3.5 times the surface area of a basketball court, hockey is a skill game that has continuous action interrupted by big hits and sudden moments of glory. It is one of the most difficult games to shoot but also one of the most enjoyable. Become a good hockey shooter, and all of your other sports photography will only get better.

Where It All Began

I spent the first part of my photography career in the early 1980s as a staff lighting assistant for *Sports Illustrated* covering indoor sporting events and location shoots for almost nine years. I usually worked on two or three assignments per week involving almost nonstop travel with huge amounts of lighting equipment and related gear. I had a firsthand opportunity to learn the ins and outs of almost every arena in North America while covering basketball, hockey, indoor track meets, and pretty much any sport that can be played under a roof. Combine this with working with every great sports photographer who graced the pages of *Sports Illustrated*, and I got the greatest paid education anyone could ask for.

I stepped out of the assistant's role in the late 1980s and took up sports photography full time. My hands-on education served me well because I was prepared to shoot sports that most photographers have no clue how to approach. The trading card companies and other licensees were just starting to gain some real momentum, and the National Hockey League (NHL) was preparing for a big expansion in the not-too-distant future. Having lit and covered numerous NHL games—regular season through the Stanley Cup Finals—I decided to create a niche for myself that few photographers had successfully achieved. I was fortunate that the NHL was getting ready to expand into Florida, where I was living in the early 1990s. I approached the newly formed Tampa Bay Lightning hockey club with a proposal to become their team photographer. I was able to convince them that I had the skill to shoot the game and could do it with a well-designed arena strobe lighting setup that would give them the best-quality images available on the film of the day.

I started shooting hockey before the advent of auto-focus telephoto lenses and today's digital cameras. It took a lot of skill and concentration to continuously frame and follow-focus on players who were moving much faster than athletes playing other sports. Also, peak game action shots always look best with the puck in the picture, so you have a lot of elements to capture in a fraction of second. Because of the slow recycle time (approximately 3–4 seconds) of arena

A nice opener shot is the first face-off at center ice at the beginning of the game. Shot with a wide-angle lens, it captures the graphics in the ice and the anticipation of the start of the game. ©Jonathan Hayt

strobes, timing is everything. There is no using the camera motor drive on strobes, and the action doesn't wait for you. Every frame counts.

The advent of the affordable, high-quality digital camera has changed the world of the nonstrobe shooter while lessening the production costs and delivery time of the strobe shooters. I was pretty excited to get one of the first Nikon D1s in 1999, and I took it to a hockey game the next day. I already had some experience with the Kodak hybrid cameras of the previous few years and knew enough about Photoshop and digital imaging to realize that the world of photography had just taken a giant step forward. The best part of the D1 was that it was new to everyone, so there quickly developed a network of photographers who were analyzing and sharing their knowledge in a way that never occurred within the film world. It was learning by experimentation and use. The first time out, I realized I had a lot to learn about this new camera, even though it produced good-quality digital files right out of the box. It handled and worked like a film camera, didn't weigh a ton, and after it was properly set up, gave a great-looking digital file up to ISO 800.

Early on, the digital gurus of the day, such as the folks at http://www. camerabits.com, came up with Photoshop plug-ins to help eliminate high-ISO digital noise. They also created a user-friendly digital photo browser that is still a standard of the industry. Adobe Photoshop Version 4.0 was the standard digital imaging software at the time, so all digital imaging was based around this version and the capabilities of the computers of the day. My greatest surprise was that the D1 had an unlimited shutter synchronization speed with my arena strobes. The new CCD sensor chip of the Nikon D1 eliminated the use of the original film camera's shutter, so there was no longer a sync issue. I discovered that I could stop peak action with both a high shutter speed in the camera and a short flash duration on my strobes. Further experimentation showed that I could even use slow flash duration or underpowered strobe lighting setups with great results. My images gained a sharpness that only comes with high shutter speeds to freeze game action. There was definitely a limit to all of this as color balance started to shift toward a blue colorcast above 1/1000 of a second shutter speed. I normally shot at 1/640 of a second with the original D1 camera. Also, the lowest ISO setting on the camera was ISO 200, so I immediately decreased the power settings on my arena strobes by one-third to gain a quicker recycling time and a shorter flash duration. The only major limiting factor at this point was the small 7.5-MB file size from the camera. I ended up using Genuine Fractals software (http://www.lizardtech.com/) to resize my images to fit output needs. This added to my workload but made digital photography completely acceptable to my clients.

The latest digital cameras have somewhat reduced this shutter speed advantage with the new CMOS sensor chips because they require a conventional shutter. That means we are now back to the original highest shutter sync speed of 1/250 of a second. Motion and ghosting are returning to indoor strobe-lit photography so that it is now critical to have strobe light systems that produce an exposure that completely overwhelms the available arena light and maintains a short flash duration. The trade-off is that the new cameras have greatly improved image and color quality and produce a much larger digital file size.

Shooting Hockey

I am focusing on shooting hockey as a photographer who consistently uses arena strobes, which I discuss in detail toward the end of this chapter, to achieve the highest image quality. The skills, equipment, and shooting positions don't differ much between shooting on strobes and shooting available light. Good timing just becomes more important when using strobes. As I said earlier, shooting available light allows you to shoot sequences and respond whenever the moment

Great moments like this game-winning goal celebration only last for a fraction of a second. I saw the game-winning goal scored and watched as the two players who made the goal and the assist skated from opposite sides of the rink toward each other. All I had was one frame to make this photo, so timing is everything when you shoot on strobes. ©Jonathan Hayt

These six pictures show the different looks of isolated player shots made from the on-ice and elevated photo positions. These work well for trading cards and photo prints.
©Jonathan Hayt

Look for the great moments of hockey, such as goal celebrations. They occur quickly and always seem to be in a place on the ice that you can't see. Keep alert for the big moments. ©Jonathan Hayt

arises. The incredible quality of the newest digital cameras' high ISO files and the internal ability to set up custom gray/white balancing for superb color has gone a long way toward leveling the field for shooting available light verses strobes.

The biggest advantage of strobes is that you achieve better light quality and more saturated color quality at the camera's best low ISO settings. Also, the ice acts as a big reflector and really kicks the strobe light up into the players' faces and bodies for an evenly lit image. You have to be a much better photographer with strobes, because you must choose your moments. Compare this to the photographer next to you, who is shooting a motor-driven multi-image sequence using the available light, and you will see that he has an advantage in quantity but not quality. Hockey is filled with great moments, but they happen quickly. You need to shoot a lot and get used to the fast pace of the game.

Fights are one of the highlights of hockey that make some of the most exciting photos in sports. They are one of the hardest aspects of hockey to shoot because the peak moments happen so quickly. Just remember that the NHL doesn't allow its licensees to use fight photos, so they are for editorial use only. ©Jonathan Hayt

The next section discusses the many different photo positions. It includes shots made from all the different shooting angles as samples of the types of images that can be made at each one. Most of these photos work well for editorial use because of their horizontal composition and inclusion of multiple players. I have shot the majority of my games for clients who want isolated shots of individual players, so I have included examples of typical shots that will sell well for trading cards and photo prints. Each photo position that I discuss offers a unique look for these types of photos, so don't worry if center ice isn't available to you.

Pick Your Spot but Ask Politely

Every hockey rink has its own characteristics regarding photo locations and lighting. I have shot in rinks all over the world and have found that there is no predictable way to shoot in all arenas. If you are as fortunate as I was to have a team that truly cared about the photographer and wanted the best possible photos like the Lightning did, you end up being involved in the design and placement of prime photo locations during the planning and construction of a new or existing arena.

The Lightning team moved to three different buildings while I worked for them, and they always provided me with the best possible photo locations that they could fit into the building. My biggest challenge was to diplomatically educate everyone involved at this level as to this necessity. I made sure that everyone knew how it would benefit the team both internally and externally while accommodating the media and licensees who needed good photo access on a nightly basis. The media relations staff already appreciated the photographer's role and gave me free rein to deal with the allocation of photo positions on a nightly basis, where I also acted as the liaison between the building event staff, security, and the team. Making friends with the arena staff and the team can have a dramatic effect on how much access photographers have to good photo spots on a nightly basis.

Unlike other sports' photo positions, most hockey photo positions are located in areas that are not a controlled part of the game field or court. You often end up standing in entry areas in the stands, on platforms in front of fans or next to television cameras, and at ice-level holes in the dasher board glass that put you right in the middle of the most expensive seats in the house. It is imperative that photographers comport themselves well and are respectful of fans and security personnel. Fans often get caught up in the passion of the moment and can be pretty ruthless when they feel that their view of the game is being infringed upon. I made sure that the team informed all the arena event staff that I was the go-to

Ice-level shots show the drama of the game and bring you right into the action. ©Jonathan Hayt

person regarding photographer issues so that it kept problems away from the team. This buffer was critical for maintaining a pleasant working environment for all of us on game night.

I always check in with team media relations staff and team photographers when I enter a new or away arena, and I ask about the local rules and get specific permission to shoot in designated photo locations. Even at the college or amateur level, there are appropriate places to work from, and the same level of respect needs to apply. Remember: most hockey rinks have limited prime shooting spots, and there is almost always a hierarchy of who gets to use them. I always ask the team photographer for his permission and help in obtaining access to the spots that I like to shoot from. I also realize that I am probably going to have to move to different locations in the building during the evening because most teams rotate photo positions in an effort to accommodate deadline shooters, such as the local newspapers and wire services.

The pecking order that you think exists in other sports really applies in hockey. The locals who cover every game and are the media mainstay of the team usually get first choice of shooting spots in the first period. At Tampa Bay, I always made it my policy to give up the best spots to these photographers during the game's first period, because I knew they would be gone to their darkrooms until the middle of the second or beginning of the third periods. I never felt that a team photographer should be the most important shooter, because I covered every game every night from start to finish, and I rarely faced any sort of deadline for the use of my photos. When I visited other arenas, I was usually working for a magazine or licensee. I asked for the best location and was happy to take what I was offered.

As I mentioned earlier, the clients whom I work for wanted strobe-lit material even when I began shooting digital. I designed and installed two sets of full-coverage arena strobe lights in the buildings that the Tampa Bay Lightning

The corner holes are a great place to shoot action around the net. Just remember that you are sitting with fans who have paid for the best seats in the house. ©Jonathan Hayt

occupied. I kept one set for my own use and rented a second set to accredited photographers working for clients who wanted strobe images. I did this so that the catwalks where the lights were installed did not become an open door for every photographer who visited Tampa. The big concern was for safety, and I set a careful standard for securing and covering all my lights and regulating who used them. The two local newspapers also were allowed to install permanent sets of lights under my supervision. They were only allowed to use their lights for the benefit of their respective papers and were not allowed to share or rent them without specific permission of the team. This protected both the team and the fans. All other photographers were credentialed to shoot from designated and approved photo positions using the building's available light.

The Best Seat in the House

My all-time favorite shooting spot in hockey and sports in general is at ice level at center ice between the team benches. When the Lightning moved to their newly built arena, the St. Pete Times Forum in downtown Tampa, Florida, they provided me with a nine-foot open area along the dasher boards between the two-team benches. This center ice spot had protective glass that ran behind the benches between the fans and the players in addition to glass on both ends between the players and the photographers. There was no glass between the photographers and the ice rink. You can't get much closer to a game than this. I was able to get a good selection of hockey helmets from the team equipment manager, and I required that all photographers wear them when shooting at center ice. Many shooters bought their own helmets so they could custom-fit them.

As photographers, we were rarely hit by flying pucks. However, the players often checked into this center ice area, and many player fights took place here involving players being shoved over the wall into our little world. The key to survival was to always shoot with both eyes open, follow the puck, and keep a good look out for players checking and making hits behind a play. Another really important part of shooting here was getting to know the crews of referees that covered the games. They typically set up right in front of this spot and went out of their way not to block the photographers.

I would shoot the entire game from the center ice location whenever possible because I produced some of my best game action and individual player shots there. It takes a long time to get used to shooting through player traffic here because you see a compressed view of the game with all of the players concentrating on the puck in front of the goal or between you and the goal.

Shooting from center ice gives a view of action in front of the net. ©Jonathan Hayt

Hard hits and fights are some of the hazards of shooting at center ice, so keep your eyes open.
©Jonathan Hayt

Hard hits by the players in front of the net compress nicely from the center ice photo position.
©Jonathan Hayt

You also have to contend with player line changes during play, where the players leaving and returning to the bench area can block your view. The bench area is also a great place to shoot players stretching during the pregame skate. The best part of this position is that you get to hear and observe the most intimate moments of play during the game.

You also have a good angle for shooting through the glass into the team benches, but you must be respectful of players and staff who might wave you off as a distraction to the game. I once had a television cameraperson ejected from center ice during a game because he became involved in a verbal altercation with a star player who waved him off after a particularly bad play. The player was in a bad mood, and the cameraperson was aggressive in doing his job. The player complained to his coach and the referees, who stopped play and made the cameraperson leave the center ice area. This involved the cameraperson's climbing through the Tampa Bay Lightning's bench full of players with his TV camera and gear while 15,000 fans jeered him. Remember that these spots are a privilege and must be treated respectfully. Don't get bigger than the game you are covering.

From the bench area, you can shoot photos of players stretching and loosening up during the pregame warm-ups. ©Jonathan Hayt

Even though I previously stated that I would always shoot as much of the game as possible from center ice, I also made sure to shoot from as many different angles as possible so that I could create variety in the look of my images. Too much of the same angle, no matter how good it is, gets stale after more than 40 home games. I had the team order and install panels of glass that had small rectangular holes cast in them along the dasher boards in spots that didn't interfere with fan seating and gave good angles on the play of the game. Most NHL rinks have switched to safety glass from plastic Lexan or Plexiglas. The older-style plastic panels are great for photographers because it is easy to cut holes for shooting spots, and the arena ice crew can usually do the work in house. The new safety glass requires that the manufacturer cast the holes in the glass, so it takes some careful planning and cajoling to get them made correctly. The NHL has issued strict standards for hole sizing and placement and has been instrumental in getting teams to install an adequate number of on-ice holes so that teams can accommodate more photographers. The holes are usually placed near the blue line and at the red lines at the four corners of the rink. They give a great shot of

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Center ice gives great access to shots in the bench area, but you have to be respectful of the players. ©Jonathan Hayt

The holes cut in the glass at ice level give a view of the goal area and behind the net that you can't see anywhere else. You don't get to shoot as much, but the photos show an intimate angle of the game. ©Jonathan Hayt

goal action and hits behind the net. Just remember that you are limited to shooting only one end of the ice, and your range of motion is quite limited. Also, be prepared to sit in a folded-up position. You might want to bring a small stool or equipment case to sit on.

The next area to shoot from is along the arena concourses or in designated elevated positions. In Tampa, the rule was that you could stand in any of the arena concourse entrances as long as you didn't impede the fans and ushers. This opened many easy-to-reach spots where you could shoot with a telephoto lens, usually a 400-mm f/2.8, and cover the entire ice with almost no obstructions. This area is a great place to learn to shoot. It allows you to achieve both high-quality and high-quantity photos. Most news photographers choose this location because they can arrive late from other assignments and walk right up and cover the entire game. Shots-on-goal and regular gameplay look good from this angle, and it is a good place to learn the rhythm of the game. I also like this angle if I am on the opposite side of the rink from the team benches so that I can shoot the coaches interacting with players and capture celebration shots when a goal is scored.

I have often added a teleconverter, usually a 1.4X, to a long lens and shot tightly on individual players in the bench area as they hang over the dasher boards waiting for a shift change. I also go down into the stands when there isn't a big crowd and shoot a lower view of the benches that looks more like the ice level. Also, photo positions were designated at the ends of the elevated television camera locations above center ice. They were a favorite of the news photographers because they offered easy access and good coverage. I found that making friends with the television camera crews often got me access to sitting or standing on their center ice shooting locations as long as I didn't move around and cause vibration in their cameras.

It never hurts to ask permission to wander the building looking for unique angles. One of my favorite spots is in Nashville where the concourse is open at both ends of the rink at the top of the lower seating bowl. I found a similar but lower spot in an old arena in Buffalo where I could shoot players coming straight up the ice along with the hard hits along the boards near the blue line. I wouldn't spend all night there, but a half period can turn up some interesting photos. Be aware that the NHL now requires netting to be hung around the back ends of the rink along the high dasher board glass, so a lot of spots have disappeared. I also made friends with the off-ice officials and received permission to kneel next to the goal judge's box and shoot with a wide-angle lens pressed up against the glass. This behind-the-goal shot makes a good close-up of shots against the goalie and a nice overview of the arena from one end of the rink. Remember that every game has a winner and a loser, and there is almost always a good photo opportunity of the winning goalie being congratulated by his team at the end of the game.

The elevated positions from the arena concourse level give a good full-coverage view of the game action. ©Jonathan Hayt

Team bench shots look great from across the ice at a low angle from the stands. ©Jonathan Hayt

The game almost always ends with the winners congratulating their goalie. ©Jonathan Hayt

Many photographers don't have access to NHL hockey and only shoot minor league, college, and amateur games. The angles are basically the same, with the added benefit of fewer rules and players and teams that are much less restrictive with photographers. I have shot in many small buildings that have seating only on one side of the rink—usually opposite the team benches. I either get permission from the teams to stand inside the bench area behind the players or just behind the bench at center ice on a six- or eight-foot A-frame folding ladder. These ladders lock in the middle and are often available with a locking platform in the middle to stand on. The ladder gets you above the players while maintaining the on-ice look of your photos. At this level of play, many teams don't care if you stand on a small stepladder behind the bench or in with the players. Just stay out of the way and leave everyone alone. I try to be as invisible as possible, and rarely am I even noticed.

Usually a good elevated spot is available to shoot from opposite the team benches in the smaller rinks. This allows coverage of both ends of the ice along with the bench area. I have also found that most small rinks still use plastic glass panels around the rink. If you shoot there regularly, many facilities are willing to cut one or two holes in the glass where there are no fans behind you or where the fans don't have access. It never hurts to ask, because most rinks have extra panels and good workshops on the premises.

Lenses and Cameras

Now that you have an idea of where to shoot in the arena, the next issue is what lenses are best to really shoot the sport. Hockey is a sport in which horizontal and vertical photos work equally well and can be shot from the same positions with a variety of lenses. I will follow the previously mentioned photo locations, because they tend to dictate the equipment I bring to a game.

The center ice and bench position is a great spot for both horizontal and vertical action shots. I like to shoot individual player shots with the equivalent of a 400-mm lens as a vertical image. Remember that I am relating this to both film and digital. A digital camera with a 300-mm f/2.8 lens gives you a focal length of between 390 mm and 450 mm with this same f/2.8 aperture depending on whether you use Canon (1.3 times the original focal length) or Nikon (1.5 times the original focal length); therefore, you are a bit loose with one and a little tighter with the other. The larger file sizes of current digital cameras give you plenty of crop room, so shoot with a lens that you can easily hold in your hand or use on a monopod. I always carried a 300-mm f/4.0 and a 400- or a 300-mm f/2.8 for this position. A 70–200-mm f/2.8 zoom lens with a 1.4X teleconverter also works

well in tight quarters. In addition, I throw a wide-angle zoom lens in my waist pack so that I can make a quick switch for the shots within the team bench areas. I usually don't keep an extra camera around my neck because I am working in close quarters with one or two other photographers and a television cameraperson who is also there to shoot the players and coaches in the bench area. It is annoying to be bumping into someone else's camera every time you move.

Also, never leave camera gear in the shelf area that is created by the dasher board structure between you and the ice. The same goes for drinks. I have seen many unwary photographers watch their expensive lenses and sodas launch into the back of the photo well when players hit the dasher boards. Remember that the dasher boards are designed to flex when the players hit them.

I prefer to use a 70–200-mm f/2.8 zoom lens with a 1.4X teleconverter to shoot horizontal action through the ice-level holes in the glass because I can zoom and track the action across a much wider area of the ice. I am using strobes, so I have the advantage of being able to shoot above the f/4.0 aperture that this setup gives. A straight 70–200-mm f/2.8 zoom lens still gives a good focal range when used with a digital camera on available light. The corner spots and blue line holes are best shot with this setup. Also, it never hurts to have a wide-angle lens on a second body for the occasional shot when the players are right in front of you, especially during fights or face-offs.

If you are shooting in a rink that has no holes in the glass and you decide to shoot through the glass, be aware of possible reflections that your body and camera can create. I always try to wear a dark shirt to reduce my reflection and add a flexible rubber lens shade on the camera. You might need to take black gaffers tape and make an expanded lens shade to completely get rid of reflections. Always keep a short roll of black gaffers tape in your bag or waist pack. Shooting through the glass limits you on camera swing because you get a lot of distortion as you angle into 1/2-inch-thick glass. Also, bring a towel along and make sure that the glass is clean inside and out way before the players take the ice. I often talk to the ice crew and ask them to run the towel over my area during the intermissions while they are clearing out the ice buildup along the boards. Get used to a lot of lost images resulting from glass distortion and colorcast that come with shooting through the glass. Also, remember that the glass moves during play, so don't daydream with your lens up against the glass. Many shooters, including me, have had to get their eyebrows stitched up after a good hit.

The elevated shooting positions almost always require a minimum of a 300-mm f/2.8 lens for horizontals and a 400-mm f/2.8 lens for verticals. I often add my 1.4X teleconverter to my 400-mm lens for tight individual vertical shots. Bring your wide-angle lens along, because the first puck drop at center ice each period

This shot was through the glass at the America West Arena in Phoenix, Arizona. No holes were cut in the glass at ice level. ©Jonathan Hayt

makes a good graphic shot when you include the logos and lines in the ice with all the players staged for the game to begin or resume. Remember that you have an advantage with the focal length extension of a digital camera; a 300-mm lens can often replace a 400-mm lens.

Remote Cameras

Hockey has several good remote camera locations, but they are not as useful as they are in basketball. The first issue is that nothing can be in the field of play because it will be destroyed and you will be told to remove it. The only really great on-ice remote is the goal camera placed inside the net at a low angle. Placement is critical; it can't be too high up, or it will block the goal judge's view of the goal line. I usually place mine around four to six inches above the ice and then check with the goal judge to make sure it is okay. Goal cameras at the NHL level need to be approved by the league, teams, on-ice officials, and goaltenders.

Don't think about just showing up and clamping a remote onto the rear upright post without going through all the right channels. The NHL has specific guidelines for the construction of a protective box for the camera. Once built, the box must be sent to the NHL for final approval.

I have constructed many goal remote cases out of 1/2-inch-thick Lexan plastic. I've designed them so that the box meets the minimum dimensions of the camera, a wide-angle lens (16 mm for film or equivalent for digital), and the remote radio triggers for both the camera and the strobes. I make mine so that I can easily unscrew the front face and replace it if it's scratched. Then I attach it to the four sides of the box. After that, I install the camera and radios in the front box and use a bolt through the bottom of the box to secure everything through the threaded tripod mount hole in the camera base. I make sure the lens is 1–2 mm behind the front faceplate so that no shock is transmitted to it if hit. I then attach the front case with camera and radios to the back cover with quick-release fasteners so that I can service the camera during intermissions. The back cover has a ball head attached to a photo clamp with extra securing screws to keep the cover attached to the ball headplate that is then bolted to the clamp. There is a fair amount of weight in this assembly, so it all needs to be bolted together so that it can't turn or rotate. I normally clamp the backing plate to the rear upright standard of the goal net and estimate the angle that I want the camera to point to. After that, I place the digital camera flat against the plate to mimic the angle and fire off a frame. I can quickly see how the photo is composed and make adjustments. I then set the plane of focus at the goal line. You can do this easily if you just hold the camera at the plane of the goal line and focus back on the remote camera box, because you can't get your head behind the camera in the net. I use this trick of prefocusing a camera from the place I want to shoot toward back to the camera-mounting area of the remote when I know that I won't be able to easily look through the camera to focus it after it is installed. I also make sure that all the camera settings are locked down or taped in place after everything is set.

The other good remote spot is from the overhead catwalks. I have tried many different positions up there, and I like the direct downward shot over the goal in addition to off angles slightly to the side and behind the net. These spots usually require a medium telephoto zoom such as a 70–200 mm or a fixed 300-mm f/4.0. They work best if they aren't too tight of a shot, because the players in the goal area and just to the edge often add drama to the goalie's save or loss. A nice start-of-the-season shot is the center ice face-off from straight overhead. Just don't forget to safety everything and then safety it again. I always had a policy of checking all remote cameras that other shooters set up in my arena so that no accidents could occur. Also, never enter a catwalk or overhead area with objects in your shirt or pants pockets. A dropped tool or pen can do a lot of damage when dropped from 100 feet up.

This photo of Tampa Bay Lightning goalie Darren Puppa making a save was shot with a 16-mm f/2.8 lens and a Nikon FM2 camera in a Lexan box. This is a low-percentage shot that requires a lot of luck and some good timing. ©Jonathan Hayt

I took these overhead remote shots from the arena catwalks. They make good graphic images.
©Jonathan Hayt

A Word on Indoor Flash (Strobe) Photography

Arena flash photography, or what is commonly called *strobe photography*, is mentioned throughout this book, so here is a short primer on the subject. Shooting indoors presents a separate set of issues regarding lighting. Most photographers will probably shoot indoors using the available light that is built into the buildings where they take their photos. This is simple to deal with. The only requirements are to shoot using a proper exposure and correct white balancing for good color quality. The second choice requires more work but enhances the quality of your images. It involves the installation and use of arena-mounted electronic flash units, commonly called *strobes*. If you shoot in the same building on a regular basis and want to improve the quality of your images, a set of strobes allows you to shoot at a low ISO rating and gain exceptional color quality.

Almost all NBA and NHL arenas have up to four sets of strobes already installed in the catwalks. They are triggered through the use of remote radios or hard wire lines that have been run down to the respective photo positions. These strobe setups are reserved for the team and league photographers, local newspapers, and accredited visiting photographers. Don't expect to gain access to these systems if you are not shooting for a client or company that has been given permission to shoot on strobes and the proper arrangements with the strobe's owners, teams, and leagues have been made. These systems that are installed in the big pro arenas usually consist of four lights for a basketball system per photographer and six or eight lights for a hockey system. The goal for a shooting exposure is between f/4 and f/5.6 at ISO 100 at 1/250 (or higher if the camera allows) of a second shutter speed with an even lighting exposure across the entire court or rink.

Usually one photographer shoots on one set of lights, although sometimes shooters share a set when there is a high demand. This is easy in hockey, when shooters can shoot at opposite ends of the ice rink and only cover action at their own ends. Basketball is tougher because this often limits photographers to shooting on strobes at their respective ends of the court and shooting the available light down-court.

Strobe units are commonly rated by watts/second for advertising purposes by their manufacturers. This is a measurement of electrical energy that is often misused and only perceptually indicates how much light a particular unit might produce. Actual measurement of light output with a light meter that is capable of measuring flash output exposure is the appropriate way to determine if a strobe is capable of producing a usable exposure. Generally, the high-output strobes for

arena use are rated at 2400 watts/second, and most photographers take this as gospel that this all they need to worry about. However, several other factors must be considered when looking into a set of strobes, such as the actual measured light output using the appropriate reflector, flash duration, recycle time, and amperage draw on the available electrical service in a building. This is where things start to get tricky, because many manufacturers make great performance claims with absolutely no data to back them up. I have been amazed at how these manufacturers do little or no field-testing, yet they all seem to produce equipment that they think has been optimized for the job. I have spent numerous hours testing various reflectors and their focusing to realize that many of the manufacturers could greatly improve on their equipment's performance.

Let's talk about lighting setups and what really works. Placement of strobe units in a building is paramount to achieving good light quality. In basketball arenas, especially the pro buildings, the ceilings usually have catwalks that are approximately 100 feet above the floor and give access to the arena's house and stage lighting. They parallel the sides of the court and allow you to place lights above the four corners of the court, where they are focused between the net and the free-throw line on the court in front of the baskets. The goal is to place the catwalk-mounted lights on your end of the court so that they don't create backboard shadows by being too far behind the net depending on your floor shooting position. You need to set the down-court lights so that you get good mid- and down-court light with the light that you shoot up into but not set so far forward that it causes flare when you shoot under your own basket. If you see the light flaring in your photos, move the light farther down the catwalk away from you until it disappears. Some arenas don't have locations that allow this sort of placement, so you have to block off the light with a black flag to eliminate this problem.

Then you need to wire the lights together so that they fire at the same instance. Most photographers use 18/2 SPT-1 wire, which is simply lamp cord wire and plastic quick connectors. Remember that the trigger voltage is extremely low, so you don't need heavy-gauge wire unless you are leaving this as a long-term permanent installation. Use a color that isn't the same as other sets in the catwalk so that you can figure out where your wires are run. It is also important to check on the trigger voltage of your particular strobes, because many older units are not low voltage, and the trigger voltage is additive as you connect lights. This can do real harm to the sensitive electronics of a digital camera, so be aware that this problem exists. You probably need to drop a line from your trigger system to the basketball court unless you are using a high-quality remote radio. Make sure you use a dark-color wire for all drop lines, because a light color shows as a big line across your down-court photos.

The only remote radios that work properly are the Pocket Wizards, which are distributed by the Mamiya America Corporation. They have been well developed and sync properly with most cameras. Make sure you check with other strobe shooters in the building so that you don't shoot on the same radio channels. If you can afford it, you can also place a Pocket Wizard receiver on each strobe unit and avoid the sync wiring altogether, especially in a situation that is only temporary or if you are in a hurry to set up.

Hockey rinks require more lights, because they are 3.6 times larger in surface area than basketball courts. A typical NBA basketball court measures 94 feet by 50 feet, and an NHL rink measures 200 feet by 85 feet. One advantage with an ice rink is that overhead lighting is hitting a big, white reflective surface, so you gain extra exposure with your strobes. Typically, it is better to light hockey rinks with six lights. You can use four on your primary side and two as backlights. You can also determine which side to front light by knowing where your main shooting spots will be. If you are shooting from the bench area or on the bench side of the ice, you can place four lights behind and above your location. You can also shoot with eight lights in hockey if you can afford them. The advantage to using four lights on each side of the rink is that your lighting becomes very even and you can shoot from almost anywhere in the arena with a consistent exposure. Most shooters almost exclusively shoot with a radio trigger in hockey, because they know that they will probably change photo positions several times during the game.

After you set up your lights and establish your metered exposure, you can shoot single frames of the game. You must allow your lights to recycle fully between shots. Many of the larger units put out a lot of power but also have 3–4 second recycle times, so you must learn to make every shot count. You need to experiment with different reflectors and their exact focusing in relation to the placement of the flash tubes in your lamp heads. I have a simple way to test this by mounting a single light on a stand and moving a distance that approximates the mounting point above the floor where you are going to use your lights. I then have an assistant hold my selection of reflectors up to the light while I fire it and check my light meter readings. The assistant moves the reflector in and out along the length of the flash tube until I see where the maximum light reading is achieved. I am usually amazed at how far off the standard position of the reflector is compared to where the most light is gained. I then make a tin sleeve that I rivet onto an accessory collar that places the reflector at the right distance from the flash tube. Many of the lighting manufacturers make well-focused lights for different distances, so try them all before you decide to light an arena. As a rule, most wide, shallow reflectors focus light better at long distances, whereas smaller, deeper reflectors spread better at short distances. The lesson here is that you can often pick one or

two f-stops of exposure and use a less powerful light unit to achieve good lighting. The other big plus occurs when you already have a big 2400 watts/second per unit light, and you can dial down the power settings to get a much shorter recycle time while maintaining a good exposure. This also shortens your strobe's flash duration, because a lower burst of power goes through a flash tube more quickly.

Flash duration is an important part of indoor shooting on strobes, because your goal is to have a lighting set that overpowers the available house lights by at least 2.5–3 f-stops in exposure. You don't want to let the ambient light become part of your exposure, because that affects your ability to freeze the action. Remember that almost all your digital and film cameras synchronize at 1/250 of a second with externally triggered flashes. If you are within several f-stops of the arena lights, you pick up this tailing of light as ghosting in your photos, because it bleeds into the exposure. Moving your strobe exposure away from the ambient light exposure reduces this effect on your image. This in turn allows the *flash duration*, the length of time that the flash actually lasts, to create your shutter speed. Most strobes have a real flash duration of less than 1/500 of a second, and many are below 1/1000 of a second. This gives a nice crisp shot that really freezes the action, so keep this in mind. Also, when you set up in an arena, find out how many separate electrical circuits are available and whether they can handle your strobes. I know many photographers who have had to spend money at various arenas to get adequate electrical service installed for strobe usage.

The Bigger Picture

Hockey photography is a real challenge, because you are confronted with a hard-to-follow game involving a small black object being chased up and down a large sheet of ice. It is important to shoot at the highest shutter speed that the conditions allow and learn to concentrate, because events happen quickly. The game is full of great action shots of players mixing it up while chasing the puck, hard-hitting checks into the boards, and great celebration shots when a goal is scored. I also look for the emotion on the bench and the concentration and great moves of the goaltenders.

On a player level, hockey is a game in which the pros are generally friendly and approachable. The nonprofessional level is great for access, and it is not difficult to develop a good rapport with the coaches, trainers, and players. I generally stay away from the locker rooms pregame because players have rituals and don't like to be disturbed. I only ask for locker room access at specific times and choose my moments carefully. The pregame preparation often provides opportunities to shoot players taping and shaping their sticks, working on equipment in the

hallways near the locker rooms, and just hanging around and greeting their friends on the opposing teams. Hockey players represent an international group; players from various countries like to visit with each other, so you can often get a nice shot of star players from places outside the U.S. enjoying each other's company. The Canadian and international players who are playing for the U.S. teams are always looking for friends to talk about home with.

I also try to shoot photos of players off-ice whenever possible, because there is little facial recognition in pro hockey. Goalie masks and helmets cover up the players, and their bulky uniforms and padding don't give you much of an idea of what the players really look like. I always emphasized this with the team staff, so they would push for off-ice photos with players because it gives the fans a different and more personal view of their favorite stars. Hockey has some great personalities that are rarely revealed during a game. I have had great fun shooting players in candid situations. The players come from all over the world and are usually willing to show you the more interesting sides of their personal lives. I always try to shoot them on team outings such as golf tournaments and public appearances. The teams also require their players to perform community service, which often makes for great photos of them out of uniform.

Take advantage of the fact that most hockey players love the game and grew up in places that are different from where they play professionally. After you have built a rapport and have earned the players' trust, they are more likely to give you access to their lives than other professional athletes. The nonprofessional players rarely see good action photos of themselves, so this can be a great way to gain good shooting access for event photography and college-level play. Just keep your eyes open and pay attention, and you can learn to shoot some of the best action shots in sports photography.

Off-ice photo shoots give you a chance to show players' characters without all the pads. These shots were from team calendars and golf outings. ©Jonathan Hayt

Soccer

Photographing soccer is similar in many ways to shooting football because you primarily use long lenses and have a wide-open field where the action takes place. Although soccer is generally a fast-paced game without many interruptions, it's somewhat easy to follow the ball and the action. You want to capture this action along with emotion, just as you would with any other sport. Soccer also offers great opportunities to photograph facial expressions, because the players don't wear any type of headgear; this fact also makes soccer photographs easier to expose because you're not concerned with faces hidden or shaded by helmets or caps. Although a few MLS (Major League Soccer) teams have recently built stadiums specifically for their own purpose, most professional-level soccer events in the United States are still played in the cities where NFL stadiums are located. Because of these similarities, you will often use similar shutter speeds and aperture settings to those you would for football. The action in soccer, however, is extremely different from football.

Positioning

Because soccer is considered a continuous-action sport, you will find yourself with plenty of opportunities to capture some intense moments during a game, albeit with some restrictions in terms of positioning. The locations in which to photograph professional-level and even college-level soccer events are somewhat restricted on the players' bench side. Players from both teams are usually stationed on one side of the field right beside each other at the middle of the field. Unless you are a league or team photographer, your positioning options are usually designated at the opposite side of the players' bench or behind one of the goals. In addition, because the players' bench is usually on the "home" side of the stadium, you are frequently shooting from the backlit side of the field if you are shooting a day game and want to be positioned around midfield. This isn't a drawback, however, because you usually have plenty of space to shoot from this side of the field. Just be sure to compensate for this situation, sometimes up to two f-stops in your exposure. Of course, this is another good reason to have a light meter to correctly measure your exposures, because shooting in a backlit situation requires this sort of exposure compensation. You will definitely want to set your exposures manually, because the auto-exposure features on most cameras do not give an accurate and consistent image exposure.

Regardless of your vantage point, you definitely need a long lens—at least a 300 mm if you are shooting digitally. Because most digital cameras come with an added multiple focal length to your lens, your 300-mm lens might be a 390-mm or 450-mm lens, depending on the brand of camera you are using. It works to

Shooting from the midfield area can provide you with many opportunities of players battling for possession.
©G. Newman Lowrance/WireImage

your advantage to get closer to the action. Of course, you can use a 1.4X teleconverter to get even closer, but I would stay away from the 2X teleconverters, which entail losing two stops on your exposures and might lead to some softer images. If you decide you want to use a 2X converter, just be sure to purchase one that is made by your camera manufacturer and suited specifically for your camera, because off brands are not as sharp.

Also, on hot days, heat waves can cause a tremendous amount of distortion when you're using long telephoto lenses, so be aware that a 2X converter can add to this problem. From these sideline locations around midfield, you can follow most of the action as teams play for positioning to set up scoring situations. Because soccer is unlike most sports in terms of goals, or points scored, much of the action is played in the center of the field. For this reason, I find the sideline positioning to be the best vantage point. Follow the ball, because that is where

Follow the ball after the goalie has kicked it. In many cases, you can capture players attempting to head the ball. ©G. Newman Lowrance/WireImage

most of the action occurs. For professional soccer events, it is always good to capture the players as they battle for the ball after a kick or throw from the goalie. Usually two or more players close on the ball and set up for an attempted header. These shots occur quite frequently at the professional level, so look for them and shoot freely.

From the Sidelines

From this sideline location, you can shoot most images horizontally to capture direct contact between the teams. As players try to maintain control of the ball, be prepared for defenders trying to seize control. The exception to this rule of general action shooting is when you are photographing just one team or one player. In these instances, your job is perhaps easier, because you are concentrating on certain situations rather then trying to capture everything that moves. In those instances, you might shoot more vertical images of individual players as they advance the ball toward you. You will also start to realize how often the action moves from one side of the field to the other, in contrast to football, where

A good place to capture players' reactions and emotions is in the bench area.
©G. Newman Lowrance/WireImage

From the sideline position, you can shoot the goalies catching a shot on goal, putting the ball back in play, or setting up to defend. ©G. Newman Lowrance/WireImage

you constantly must move up and down the field to follow the action. Provided that you have a long enough lens, you can shoot both sides of the field and capture everything from dribbling to throw-ins, traps, corner kicks, and even goalie saves. Of course, you might also consider carrying a second camera body with a zoom lens, such as a 70–200 mm, when the action gets close to you.

You may also look for nice isolations of players when you are remotely close to the bench area, especially late in the game when the outcome might already be determined. Once again, capturing emotions is important, because players will generally display their feelings if their team is about to win or suffer a defeat.

The sideline position is also an ideal position to capture images of the goalies as they prepare to protect the net, leap up in an attempt to catch or block the shot on goal, or throw or kick the ball back in play. The difficult part is that, while you're attempting to shoot the goalie in action, players may block your view as the action gets close to them. A little luck is involved here, because you need to keep your concentration on the goalie and try to anticipate what's about to occur. One key is to watch the goalie's eyes, because they might give you a hint on what his next action will be. If you miss the goalie leaping or diving for the ball, remember that you'll also have several chances to capture him holding the ball before he puts it back in play.

From the Endline

Another option is to take a position at one end of the field on either side of the goal behind the endline. This vantage point allows you to capture a player perhaps advancing toward you and the goal in front of you. In this case, you might find yourself using your 70–200-mm zoom lens more often, as the team gets closer for an opportunity to score. You can then keep the player who is attempting to score and possibly the goalie in your viewfinder. If you are using your telephoto lens while the players are around midfield, you probably want a vertical, isolated shot of the player dribbling toward you and then kicking the ball.

You have several photo opportunities from this position, but the disadvantage is when the action goes to the far side of the field toward the other goal. You might then be 100 yards or so from the action and will have to wait for the teams to come back to your side. Don't forget that an international-sized soccer field is 120 yards long by 80 yards wide, so you are covering a big field of play. If the teams are playing by international rules, your location will also be limited to this endline area. In addition, remember that you don't always need to photograph a player dribbling or being close to the ball. You can always shoot isolated images of players without the ball as they move closer to the action.

From this endline position, you should also be able to capture some sideline activity, either from the bench where the players and coaches reside, or further out where the fans are watching. As in all sports, capturing some elements of the various aspects of the game can be advantageous and can give your photo shoot a well-rounded appearance.

Shooting from behind the goal can often lead to players coming directly toward you.
©G. Newman Lowrance/WireImage

Overhead

Another positioning option is to shoot from a higher vantage point from the bleachers or stadium. I would often shoot MLS games from this location when the background was insufficient, either from a lack of fans or a distracting entity that would take away from my images. Shooting from this location will often lead to cleaner shots, and it is often easier to follow the action from a higher location. The disadvantage, once again, is the distance you are from the action. Once the players cross the midfield line and head to the opposite side from where you are shooting from, you are left waiting for them to return closer to you unless you have an extremely long lens, like a 600 mm. Also, if you are shooting youth soccer, you might not be able to get quite as high as you would prefer, but it still could lead to a viable option if the sidelines around the field are cramped and full of people or fans watching the game.

Shooting from a higher vantage point is another option for cleaner sight lines from a different angle.
©G. Newman Lowrance/WireImage

Youth Soccer

Shooting youth soccer is much easier than shooting professional soccer. First, you probably have unlimited access to roam practically anywhere you want to be around the perimeter of the field. Second, you don't need to worry about obtaining a credential, because children's sports are easily accessible to everyone. Third, the field is smaller, and you can get by with a shorter telephoto lens or maybe even a long zoom lens to capture the action. Despite the differences in shooting youth soccer versus professional soccer, you can apply the same positioning methods as described for the professional-level games. However, because the players are smaller and slower, capturing good shots is much easier. The level of youth sports also allows for some great sideline shooting of the coaches or parents as they cheer on their respective teams. In addition, watch for some separate, isolated shots of the players during time-outs or stoppages in play, because these types of images capture moments that a parent treasures. Take both vertical and horizontal images so that you have several options when choosing your best images after the event.

Shooting youth soccer is much easier than shooting professional soccer because it usually gives you unlimited access. ©G. Newman Lowrance

Always look for shots during time-outs and stoppages in play, because they can lead to some nice isolated images. ©G. Newman Lowrance

Of course, shooting youth soccer might also lead to some evening events. In that case, your lighting situation is likely to be marginal at best. When photographing night games, you need a lens with an f/2.8 maximum aperture opening to allow you to use the fastest shutter speed. Because the youth level isn't as fast, you can probably get away with a shutter speed as low as 1/250 of a second, depending on the level of play, but use the fastest shutter speed that the lighting allows so that you have a better chance of freezing the action. Once again, I advocate shooting all fast-moving sports at a shutter speed of at least 1/640 of a second if you want to minimize subject movement. The current high-end digital cameras have greatly reduced digital noise at the ISO 800 through ISO 3200 settings, so try to keep shutter speeds high. Movement in a photo is far worse than a little bit of noise that you can remove in Photoshop during post-processing.

Although soccer on the professional level doesn't have the same status as other professional sports, the popularity at the youth level increases every year. Most leagues have a photographer already in place to shoot the team and individual photos, but you can find great opportunity in showing up and taking action shots

at these youth events. Few leagues at this level have anyone shooting action shots. Children tend to express their emotions unconditionally during a game, so be on the lookout for shots that capture joy, sadness, and even anger.

Remember that emotion is a major element of what makes an image worthwhile. Shooting all these elements is a great way to break into sports photography, meet new people, and advance to bigger and better things in your shooting adventures.

Watching for images that display emotion is a key element in sports photography, regardless of the sport. ©G. Newman Lowrance/WireImage
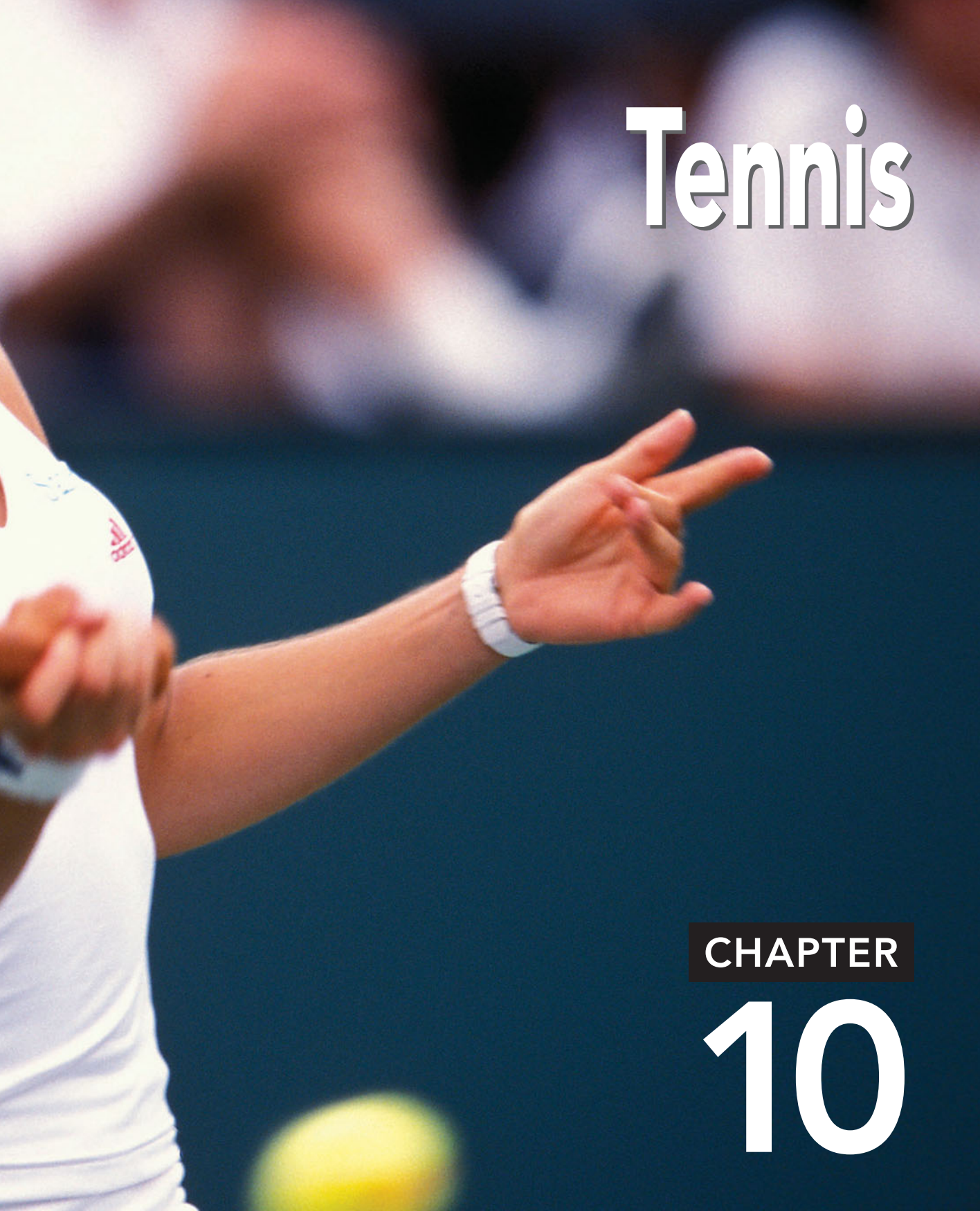
Tennis

If you are just beginning your adventures in sports photography, tennis is a good place to start. That's partly because you will only be covering two players unless, of course, you are shooting a doubles match. Another reason is the general way in which tennis is played. You know from which location the player is going to serve the ball and where the receiving player is standing. You also know the general areas in which the players will move due to the court size.

Tennis is a good sport for training your eye to follow the player's pursuit of the ball as he volleys to his opponent during the match. Because the basic area of play is relatively small compared to other outdoor sporting events, the area in which the players will often be positioned is somewhat predictable. As a result, you can easily track an individual player as he moves around the court in his attempts to hit the ball back to the opposing player. Players have different styles of play. Some are aggressive and attack the net, whereas others play back from the net and try to win the point with volley play. Although you might not know the players' style of play initially, you should become aware of how they play as the match goes on. These individual movements are unique and present the challenge in capturing good tennis images.

Tennis is a great sport for training your eyes to follow the action. ©G. Newman Lowrance

The intensity and style of
a player is often reflected
during the serve.
©G. Newman Lowrance

Every player has a unique style in tennis. Trying to capture this individualism is a key element in shooting tennis.
©Jonathan Hayt

Positioning

At most professional tennis matches, photographers are positioned together at center court opposite the players' bench, or along the ends of the courts behind one of the players looking toward the net. Generally, the best position to capture both players is at the center court position. Regardless of which player you want to concentrate on, he is often right in front of your lens during the match. From here, you can focus on one player as he serves, reacts to his opponent's return, and then roves to the ball and hits his subsequent shot. This also allows you to shoot with the same camera lens in both directions. You can photograph a player as he ranges back and forth or up and back around the court. Many players display great emotion as they try to range to the ball. This is also a good location to obtain bench shots, because the players are directly opposite of you. The resting periods within the match are good opportunities to get some isolated shots as the player prepares for the

You can also shoot horizontal images with a zoom lens, such as a 70–200 mm. Notice the other photographer in the backcourt shooting from behind the net. ©G. Newman Lowrance

An example of shooting from the courtside location, this time of the player making a return shot. ©G. Newman Lowrance

When shooting tennis, focus on the players' concentration, not the ball. ©G. Newman Lowrance

remainder of the match. As you are focusing on these types of images, watch for a player's body language. He might be upset at his performance and talk to himself, or he might pump himself up to get going. Or perhaps he's noticeably exhausted. Whatever the situation might be, getting an image of this kind of moment can define how you portray the final outcome of victory or defeat.

You can photograph many other nuances of individual styles. Often, the player who is getting ready to receive a serve practically dances on his tiptoes or moves with his feet to prepare for the serve location. Similarly, you might find players holding their rackets a certain way as they set up. In addition, the player who is making the serve often takes a final look at his opponent's defensive position before launching the ball. These individual styles can provide various looks for you as a photographer.

Capturing emotion from a player is always something to look for.
©G. Newman Lowrance

Photographing from behind the net provides a completely different perspective. In this position, the player on the far side of the net faces you directly, and you can shoot some great action showing both players. If you are shooting horizontal images with a zoom lens such as a 70–200 mm, both players are often in your viewfinder, and you can capture some great shots that show the positioning and angles that occur. You can also shoot with a long lens and wait for a player to attack the net. Hopefully you can capture a great "kill" shot or a nice return shot.

For bigger events, you might even consider an overhead location. If the stands surrounding the courts give you this option, by all means use it to your advantage. You can try many different lenses from this vantage point. Take a few shots with a wide-angle lens to show the overall surroundings, which a corporation might like to have for a brochure. Alternatively, you can shoot isolated images from here with a long lens, albeit from a different angle. You can even use a tripod and attempt some long exposures for a different approach. In a nutshell, the more images you have from various vantage points, the more choices and strength your images have. This is true regardless of the sport you are shooting. Try moving around from all the locations to get several different vantage points as you cover each player. You will find yourself with several different looks that might be appealing to a client for the player you are photographing.

Lighting and Exposures

Generally, professional tennis is played outdoors during ideal weather situations, so lighting shouldn't be a problem. If the lighting is such that one player is frontlit and the other is backlit, you obviously need to compensate your exposures accordingly. If you are shooting manual exposures and find it difficult to adjust, you can always shoot one player while he is on one side, and then wait until the players change sides to get the other player in the same light. Usually, this isn't a hindrance.

At night or indoors, you will probably find yourself shooting at extremely high ISO settings, such as ISO 1250 or ISO 1600. Remember that the new digital cameras allow you to accurately set ISO settings in smaller 1/3 increments, so take advantage of using the lowest ISO that will get the job done and still allow for a high enough shutter speed to stop the action. Because you will be shooting available light, you won't have control over the lighting except for what your camera can provide. In these cases, like other sports, choose a high enough ISO and shutter speed to stop the action sufficiently. Although these settings might be different depending on what level you are shooting, I would recommend that you shoot with the highest shutter speed allowable to freeze the action. In tennis, the ball is the object traveling with the most speed, so I wouldn't worry so

Regardless of the sport, shooting
with correct exposures is a must
for creating worthwhile images.
©G. Newman Lowrance
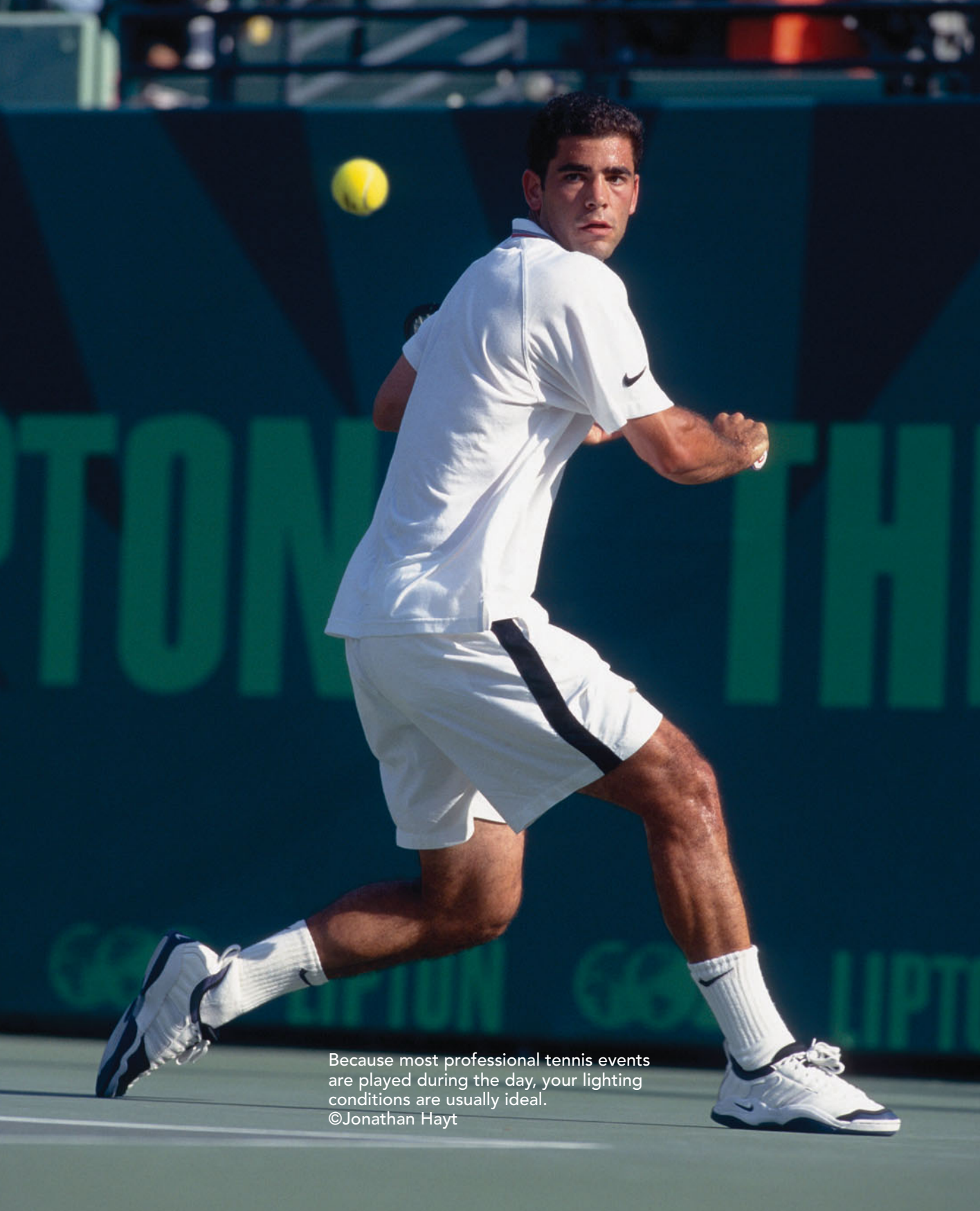
Because most professional tennis events are played during the day, your lighting conditions are usually ideal.
©Jonathan Hayt

much about freezing it in flight. However, you should at least minimize the blur effect on the players. For amateur levels, you might try to use a minimum of 1/250 of a second with an f/2.8 opening, but experiment with the speed of the players you are covering. I've spent many Friday evenings shooting high school football games, where the lighting is usually at its worst. I had to learn where the best lighting was on the field, and where it was practically nonexistent. Learning the different aspects of available lighting is a helpful, although sometimes painful, element in sports photography. These types of experiences are wonderful for learning and will assist you in dealing with similar situations at other events down the road.

Public Courts

Of course, it is much easier to photograph tennis at schools or public courts, where access is typically unlimited, and you have free rein to move around as you want. In these situations, use your access to your advantage, and capture everything that you can. I would recommend, however, that you inform the players of your intentions. Most players at the amateur level are not accustomed to having their photographs taken, and some might feel uncomfortable. Others might love the attention and play harder, even showing more emotion than under normal circumstances. Regardless, most people love to get coverage, and it could lead to some sales and good experience for you. This is a great time to experiment with different shutter speeds, apertures, and ISO settings that will increase your knowledge as you progress to higher and faster levels of play.

Glossary
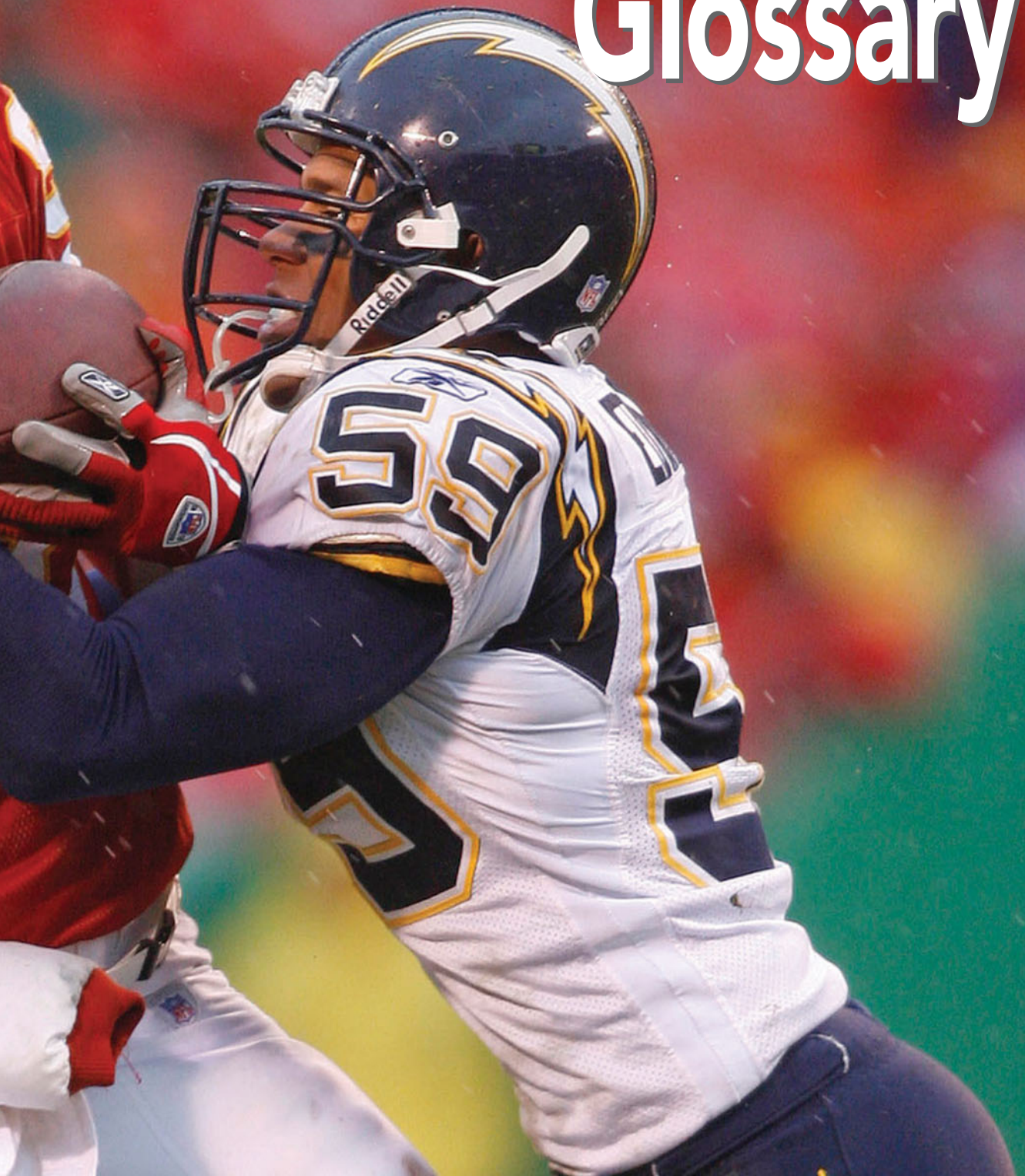
This glossary takes into account many definitions and terms attributed to the world of digital photography. The following links were used to compile the bulk of this glossary. You can use them to obtain further information about any of the terms:

- http://wwwca.kodak.com/CA/en/consumer/guideToBetterPictures/glossary.jhtml
- http://www.nikonians.org/html/resources/photography-glossary.html#A
- http://www.digitalexposure.ca/sub1.html
- http://www.canon.co.uk/For_Home/Product_Finder/Cameras/Digital_Camera/digicam_glossary.asp

acutance—The power to resolve detail in the transition of edges. *See also* sharpness.

AE (auto exposure)—A mode in the camera that adjusts the shutter speed, the aperture, or both by using the built-in light meter. These definitions are defined as follows: Programmed AE (P mode), where the camera sets both aperture and shutter speed; Aperture Priority AE (A mode), when the user sets the aperture and the camera finds the most appropriate shutter speed; and Shutter Priority AE (S mode), when the speed of the shutter is set by the user and the aperture by the camera.

AF (auto-focus)—When applied to a lens, AF allows the lens to focus automatically on an object within its focusing sensors. When AF is attached to an auto camera body, you don't need to use the aperture ring in auto modes. When applied to a camera, AF means that it is equipped with auto-focus capability and an auto-focus lens.

ambient light—The available natural (sun-lit) light in a scene.

American Standards Association—*See* ASA.

angle of view—The portion of a scene that is covered by a lens or viewfinder. This is determined by the focal length of a lens and film format.

aperture—The lens opening through which light passes to expose the film. The size of aperture is either fixed or adjustable. Aperture size is usually calibrated in f-numbers—the higher the number, the smaller the amount of light that passes to make the exposure.

aperture priority—Aperture Priority Auto Exposure (A mode). A mode of automatic exposure in which the photographer selects the aperture and the camera sets the shutter speed. This is the most used mode because it is the appropriate one for accurate depth of field control.

ASA (American Standards Association)—Used in conjunction with a number, such as ASA 200, to refer to film "speed" or light sensitivity. The higher the number, the more sensitive the film is to light, allowing for faster shutter speeds or smaller f-stops. ASA has been replaced by ISO, but the scale remains the same. *See also* ISO.

auto-focus—*See* AF.

automatic exposure—A mode of camera operation in which the camera adjusts the shutter speed, the aperture, or both to produce the correct exposure.

automatic white balance (AWB)—Digital cameras come with an automatic white balance meter that essentially tells the camera which intensity of the color white is in the picture. The rest of the colors in the spectrum are adjusted accordingly to make the image look as natural as possible.

available light—Existing light surrounding a subject. It can be natural or artificial, but the photographer does not add it, as with strobes or flash photography.

AWB—*See* automatic white balance.

backlighting—Light coming from behind the photo subject. Backlighting can cause underexposure of the main subject with auto exposure systems, lending itself to the use of fill-flash or spot metering.

barrel distortion—*See* distortion.

bellows—A flexible, light-tight, and usually accordion-folded device mounted on cameras that allows the lens to move toward or away from the film plane for greater magnification than with the lens alone. It is usually employed for close-up or macro work.

bit—A bit, which stands for *bi*nary digi*t*, is the smallest unit of digital information. Eight bits equals one byte. Digital images are often described by the number of bits that represent each pixel. That is, a 1-bit image is monochrome; an 8-bit image supports 256 colors or grayscales; and a 24- or 32-bit image supports true color.

blur—Also known as ghosting. This effect is caused by an excessive movement of the camera, a zoom lens, or the subject. Blur is often intentional in creative photography to convey the feeling of motion. Blur or ghosting can also be the result of slow shutter speed or slow flash duration in flash photography.

brightness—(1) The balance of light and dark scenes in an image. (2) The amount of light that is reflected by a surface. (3) The intensity or quantity of light emitted from a light source. (4) The condition or quality of luminance from a color.

buffer—Temporary memory area that stores data before it is written into a permanent area. In digital cameras, buffer refers to the memory where images are stored before they are written to the memory card.

built-in meter—A reflected-light exposure meter built into a camera so that light readings can be made directly from the camera position.

camera—A picture-taking device usually consisting of a light-tight box or container, a film cartridge or memory card (image) holder, a shutter to allow a measured quantity of light, and a lens to focus the image.

cartridge—A light-proof film container, made of metal or plastic, that permits a roll of 35-mm film to be loaded into a camera in the light. It is often called a magazine or cassette.

cassette—*See* cartridge.

CCD (charged coupled device)—A semiconductor device that is often used as an optical sensor. It stores charge and transfers it sequentially to an amplifier and detector used in digital cameras to capture an image.

charged coupled device—*See* CCD.

chrome—A trade term for color transparency film.

close-up—A larger-than-normal image that is formed by focusing the subject closer than normal to the lens with the use of supplementary lenses, extension tubes, or bellows.

CMOS (complementary metal-oxide semiconductor)—A method of constructing transistors that produces microchips that run with relatively low power consumption. This type of image sensor chip is replacing the CCD. *See also* CCD.

CMYK—Acronym for cyan (process blue), magenta (process red), yellow, and black, the primary colors of ink used to create color prints from typical printers. CMYK is not to be confused with the primary colors of light, which are red, green, and blue (RGB).

collimation—The precise alignment of lens optics in relation to the film or image plane of a camera body. This term describes the parallelism of a camera body lens mount to the film plane.

color—The property of objects (or light sources) described in terms of a person's perception of red, blue, green, or other shades and lightness (or brightness) and saturation.

color balance—(1) The ability of media to reproduce accurately the colors of a scene. Color films are balanced for use with specific light sources. (2) The reproduction of colors in a color print, alterable during printing or post-processing.

color cast—A slight trace of one color in all the colors in an image.

color reversal—*See* positive.

color temperature—Measured in Kelvin (K) degrees, the temperature at which a blackbody emits radiant energy that is competent to evoke a color the same as that evoked by radiant energy from a given source (as a lamp). Photographers need to understand how light changes and film records it so that they can filter it to fit the film in use. Average noon daylight has a color temperature of 5500 K. A common tungsten house light bulb has a color temperature of 2800 K. Tungsten studio lamps measure 3200 K, and photo lamps or photofloods measure 3400 K.

CompactFlash card—Trademark name for one type of digital camera's reusable memory card on which images taken by the camera are stored. It is available in a wide range of storage capacities and recording speeds.

continuous servo auto-focus (AF)—An especially useful AF mode when you are focus tracking fast-moving subjects. Using this mode, you can release the shutter at any time, even if the picture is not in focus. As long as the shutter is activated while half depressed, this mode keeps a subject in focus and makes calculations to the subject's positioning at the moment of firing. The setting is typically stated as AF mode "C" on cameras.

continuous tone—Describes an image containing a range of tones from black through many intermediate shades of gray to white.

contrast—The apparent difference in darkness or density between one tone and another. Contrast also refers to the gradual shade difference between black and white. Fewer gray values are described as "high contrast." Many shades of gray are considered low contrast.

convergence—The phenomenon and occurrence in which lines that are parallel in a subject, such as the vertical lines of houses or buildings, appear nonparallel in a photo.

copyright—A form of protection provided by the laws of the United States (title 17, U.S. Code) and other countries to the authors of "original works of authorship," including literary, dramatic, musical, artistic, and certain other intellectual works. This protection is available to both published and unpublished works. Section 106 of the 1976 U.S. Copyright Act generally gives the owner of copyright the exclusive right to reproduce, distribute, perform the work, or display it, and to authorize others to do the same. These laws are similar in all countries. Copyright is also considered a legal right of creative artists or publishers to control the use and reproduction of their original works.

crop—To trim the edges or enlarge a portion of an image to improve the composition.

curves—A function in Adobe Photoshop that allows a change of the tonal range of a digitized image. It permits anything from simple modifications in shadows, highlights, and midtones to complicated adjustments at any point within a 256-color (from 0 to 255) tonal range of the entire image or precise modifications to the individual color channels of an image.

darkroom—A light-tight room where photographs are developed or printed. In this room, a photographer is able to handle light-sensitive materials without causing unwanted exposure.

daylight—Ambient light with a color temperature of 5500 K. Average daylight, combined with the reflected light from the sky, produces natural ambient light.

depth of field—The area between the nearest and farthest points from the camera that are acceptably sharp in the focused image. This can also be identified as the zone of acceptable sharpness in front of and behind the subject, on which the lens is focused. Depth of field varies according to lens focal length, aperture, shooting distance, and many other factors.

depth of focus—The range in front of and behind the focal plane within which a sharp image is produced when a lens is focused.

diaphragm—The mechanism controlling the brightness of light that passes through a lens. An iris diaphragm has overlapping metal leaves whose central opening can be adjusted to a larger or smaller size. *See also* aperture.

digital—A device or system that uses binary information that can be stored and processed. This binary information has two states, where 0 is on and 1 is off. These states are translated into data called bits. *See also* bit.

digital camera—A camera that captures an image through the lens on an electronic image sensor, a CCD, or a CMOS chip. The image is then temporarily transferred to a memory buffer and stored onto a FlashCard for eventual download and manipulation on a computer.

digital noise—*See* noise.

digitization—To store and process the transformation of analog data to digital data.

DIN—Stands for *Deutsches Institut für Normung*, the German Institute for Standardization that was founded in 1917. It's a numerical rating used in Europe that describes the sensitivity of a light-sensitive material to light. The DIN rating increases by 3 as the sensitivity of the light-sensitive material doubles.

distortion—The effect of straight lines not being rendered perfectly straight in an image. Two types of distortion exist: barrel and pincushion.

dots per inch—*See* DPI.

download—The process of transferring computer data from one location to another, such as digital images from the camera's memory card onto a computer, from a computer to a memory device such as a CD-ROM, or files from the Internet onto a computer.

DPI (dots per inch)—As applicable to the resolution of a printer, the number of dots it can print per inch. The higher the number, the higher the resolution. Inaccurately, this term is also applied to scanners and digital cameras instead of PPI (pixels per inch), as if a dot were equivalent to a pixel.

electronic flash—*See* flash.

existing light—Available light. Covers all natural lighting from moonlight to sunshine. Photographically speaking, existing light is the light that is already present on the scene or project, or scenes that are artificially illuminated after dark.

exposure—The amount of light that reaches film or the combination of f-stop and shutter speed that controls the amount of light reaching the light-sensitive material. In addition, this term describes an exposed piece of film. *See also* f-stop numbers; shutter speed.

exposure compensation—Often referred to as EV compensation by deliberately changing the exposure settings recommended by a light meter to obtain a different exposure to fit a personal preference, create special effects, or meet special requirements.

exposure meter—An instrument that measures the amount of light falling on a subject (incident-light meter) or emitted or reflected by a subject (reflected-light meter), allowing aperture and shutter speed settings to be computed. This is commonly called a light meter. Many light meters are also capable of metering flash or strobe exposures.

extension tubes—Provide an additional extension to make the lens focus at closer distances and produce higher magnification. Extension tubes are usually manufactured with metal tubes. They have a rear-lens mount at one end and a camera-body mount at the other end.

factor—A number that tells how many times the exposure must be increased to compensate for loss of light (for example, because of use of a filter or converter).

fast film—A film that has high sensitivity to light, needing less light to obtain a proper exposure. Fast film is recommended for action and low-light photography. This term is normally applied to films that have ISO 400 and higher.

fast lens—A lens that has a maximum wide aperture and low f-number (such as f/4, f/3.5, or smaller), allowing it to gather more light than a slow lens, which has a narrower open maximum aperture.

file format—A common computer-related term to describe programs or data file types such as JPEG, PSD, TIFF, PDF, PICT, or EPS.

film—A photosensitive material that is used in a camera to record an image. Film is made from a thin, transparent base coated on a flexible acetate or plastic base covered with light-sensitive chemicals.

film speed—The relative sensitivity of a film to light. Several rating systems are available: ISO/ASA (the most common in the United States and Great Britain), DIN (common in Europe), and others. Film speed ratings increase as the sensitivity of the film increases. ISO is the contemporary term.

filter—(1) A piece of colored glass, plastic, or other material that selectively absorbs some of the wavelengths of light passing through it. (2) To use such a filter to modify the wavelengths of light reaching a light-sensitive material.

fisheye lens—A lens that has an extremely wide angle of view (as much as 180°) and considerable barrel distortion.

fixed focal length—A nonzoom camera lens that has an unchangeable focal length.

flash—An artificial light source, such as a flashbulb. Flash is often called strobe or electronic flash.

flash card—A removable memory device that is capable of storing the image data after the system is turned off.

flash duration—The duration of a flash burst from an electronic flash or strobe light.

flash range—The distance range within which an artificial light is capable of rendering well-illuminated subjects for proper exposure. The range is a function of both the maximum and minimum flash output capability of the unit and the aperture selected, whether automatically or manually. Flash range is also affected by the ISO speed in use.

flash sync (synchronization)—The shutter speed that corresponds to the proper timing of the flash. If the flash sync is too fast, the shutter won't be open for the duration of the flash. If it's too short, the subject movement might cause blur.

f-number—A scale that expresses the relative area of the aperture of a lens, which is the result of dividing the focal length of the lens by the effective aperture of the lens opening (the apparent size of the diaphragm seen from the front of the lens). The f-number, or f-stop, increases by the multiple of the square root of 2, or 1.4142, from 1.0, 1.4, 2, 2.8, 4, 5.6, 8, 11, and so on, allowing each setting to pass half the light of the aperture below and twice the light of the aperture above in the scale.

focal length—The distance from the lens to the focal plane when the lens is focused on infinity. Generally for 35-mm format, lenses that have a focal length of approximately 50 mm are called normal or standard. Lenses that have a focal length of approximately 35 mm or less are called wide-angle. Finally, lenses that have a focal length of more than approximately 90 mm are called telephoto lenses.

focus—To move the lens or position it in a way enabling light rays to converge so that you can record a sharp image on the film.

focus mode—For contemporary professional digital cameras, three basic types of focus modes exist: single servo AF (S), continuous servo AF (C), and Manual AF (M).

focus priority—A camera mode in which the shutter cannot be released until the subject is in focus, as when using single servo AF (S).

focus tracking—An advanced feature whereby a camera's microprocessor analyzes a moving subject's speed by anticipating the position of the subject at the exact moment of exposure, and driving the lens to that position based on the information.

foreground—The area between the camera and the subject.

format—The size of the camera or the size of the film. Camera sizes come in APS, 35 mm, medium, and large format. Film formats come in APS, 35 mm, 645, 6×6, 6×7, 6×9, 4×5, 5×7, 8×10, and so on.

freeze focus—A feature by which the shutter is automatically actuated when the subject reaches the preset focus point. *See also* preset focus.

frontlighting—Light shining on the front or side of the subject who is facing the camera.

f-stop—*See* f-number.

f-stop numbers—A number that equals the focal length of a lens divided by the diameter of the aperture at a given stop. The larger the number, the smaller the opening of the lens; the smaller the number, the larger the opening of the lens.

FTP (File Transport Protocol)—A protocol that allows users to copy files between their local system and any system they can reach on a network or on the Internet.

ghosting—*See* blur.

grain—The granular appearance of an image. Grain becomes more pronounced when you're using faster film speeds and when you enlarge an image.

grayscale—An image made up of varying tones of black and white but no color. Grayscale is synonymous with black and white. The gray-level system divides grayscale into 256 sections, with black at 0 and white at 255.

grip—A worker who moves the camera around while a film or television show is being made. Grip is a common term for a photo assistant in the photography industry who possesses knowledge of cameras and lighting.

highlights—The brightest or whitest parts of an image.

histogram—A graph defining the contrast and dynamic range of an image.

hue—Color or gradation of color. Hue also refers to the attribute of colors that permits them to be classified as red, yellow, green, blue, or an intermediate between any contiguous pair of these colors.

image—A scene that is represented by a two-dimensional medium.

image editor—Allows adjustments to an image to improve its appearance using computer software. With image-editing software, you can darken or lighten a photo; rotate it; adjust its contrast, colors, hue, and saturation; crop out extraneous detail; remove red-eye; and more. Adobe Photoshop is the professional image-editing standard.

image resolution—The number of pixels in a digital photo.

incident light—Light as measured as it falls on a subject or surface, instead of light being reflected from a surface.

infinity—The farthest position on the distance scale of a lens. In relation to camera focus, this refers to the horizon.

International Organization for Standardization—*See* ISO.

ISO (International Organization for Standardization)—The letters actually stand for International Standards Organization, which also refers to a film's sensitivity to light or, more commonly, its speed. The term is pronounced by the

individual letters: I-S-O. It is not considered an acronym, but a word derived from the Greek *isos*, meaning equal. The early term was ASA, which stood for American Standards Organization.

Joint Photographic Experts Group—*See* JPEG.

JPEG (Joint Photographic Experts Group)—A digital image file format standard in which the size of the file is reduced by compression. A JPEG image file name carries the extension JPG. JPEG compression is loosy, which means that it loses some image information as opposed to other formats, such as TIFF. A high-quality JPEG file loses less than a low-quality JPEG file.

K (Kelvin)—Thermodynamic temperature scale measurement. In photography, it is a numerical description of the color temperature of light at different wavelengths. In 1933, the International Committee of Weights and Measures adopted the temperature at which water, ice, and water vapor coexist in equilibrium as a fixed point, the triple point of water; its value was set as 273.16. The unit of temperature on this scale is called the Kelvin, after William Thompson Lord Kelvin, and its symbol is K (no degree symbol used).

LCD (liquid crystal display)—An information display method. Usually used for external displays on cameras, speedlights, or other electronic devices, such as flat-screen computer monitors.

lens—A piece or several pieces of optical glass shaped to control and focus a subject's light.

lens flare—The soft effect that is visible in a picture as a result of stray light that passes through the lens but is not focused to form the primary image. You can control flare by using optical coating, light baffles, low reflection surfaces, or a lens hood.

lens hood/shade—A lens addition, ring, or tube in front of the lens that minimizes lens flare.

lens speed—The maximum aperture of a lens. A lens that has a wide aperture (such as f/1.4) is called fast because it transmits more light than a slow lens (such as f/5.6).

light box—A device for viewing film. This box uses sunlight-balanced fluorescent tubes and is covered with glass or a plastic surface on which film negatives and positives are placed for viewing.

light meter—*See* exposure meter.

liquid crystal display—*See* LCD.

loupe—A small magnifying glass for viewing slides, negatives, and contact sheets. 8X to 10X are common loupes.

magazine—*See* cartridge.

magnification—The size of an image relative to that of the subject, as expressed in a ratio.

manual camera—A camera that lacks auto-focus capability. You can use AF lenses on manual cameras, but you need to focus them by hand.

manual mode—Mode on the camera when the automatic capabilities are disabled. Used for complete control when a camera user wants to manually set both the aperture and shutter speed settings.

MB—*See* megabyte.

media—Material that data or images is captured to and stored upon. Items such as CompactFlash cards and CDs are referred to as common storage media used with digital photography.

megabyte (MB)—A measurement of data storage that equals 1024 kilobytes (KB).

megapixel—One million pixels.

meter—Any measuring device. In photography, it is commonly referred to as a light meter, although it could also refer to a color meter.

mode—Type of exposure method used by a camera. Common modes include Manual mode (M), Aperture Priority mode (A), picture mode, and flash mode.

monochromatic—Tending toward one color. A monochromatic image is one displaying only black-and-white or grayscale information.

monopod—Single-legged camera support. A monopod is a good substitution for handholding telephoto lenses while allowing mobility.

motor drive—A device for automatically winding and rewinding the film in a camera. Most contemporary professional cameras have motor drives built in. Another term for motor drive is motor winder or speed winder.

motor winder—*See* motor drive.

negative film—A photographic film that has been exposed to light and processed in a way that the image is reversed; the shadows are light and the highlights are dark.

noise—Also known as digital noise, this is the random colored pixels that appear in dark or shadow areas when the light levels are below the camera's CCD sensitivity range.

normal lens—A lens where the focal length is approximately equal to the diagonal of the film size that it's being used for. This is also representative of the same angle of view and perspective of the human eye. In 35-mm format, the normal lens is approximately 50 mm; in medium format, it's approximately 90 mm; and in 4×5 format, it's approximately 200 mm.

overexposure—Light-sensitive material that has been exposed with too much light to obtain a properly exposed image.

panning—The act of following a moving subject as you release the shutter that allows the object to remain sharp and the background to be blurred.

perspective—The apparent size and depth of objects within an image.

photography—From the Greek *Photos* and *Graphos*, photography is light writing or writing with light. It's the mix of art, craft, and science for the creation of images on a light-sensitive surface.

PICT—A Macintosh graphic imaging file format using a PCT extension. PICT can contain object-oriented and bitmapped graphics.

pixel—Short for *pic*ture *el*ement. This refers to any of the small, discrete elements that together constitute an image (as on a computer CRT or television screen), or any of the detecting elements of a charge-coupled device used as an optical sensor in a digital camera.

positive—Any image that has tones corresponding to those of the subject matter. Positive also refers to a slide, transparency, or color reversal film.

PPI (pixels per square inch)—A measurement regarding image quality. The greater the number, the better the image quality.

preset focus—To focus at a predetermined distance when shooting a moving subject as it goes by the focus point. This technique is employed with both manual lenses and when locking focus with auto lenses in anticipation of fast-moving subjects. *See also* freeze focus.

primary colors—Red, yellow, and blue, the three colors that make white light when they're combined.

prime lens—A lens that has a single, fixed focal length; not a zoom lens.

processing—In photography, a chemical process in which an undeveloped photographic image is converted to a stable visible image.

pulling—Overexposing and underdeveloping film to effectively reduce its speed or ISO. *See also* pushing.

pushing—Underexposing and overdeveloping film to effectively increase its speed or ISO. *See also* pulling.

RAW—The data from a digital camera as it comes directly off the CCD, with no in-camera processing performed.

recycle time—The time that it takes for an electronic flash, strobe, or battery pack to recharge so that it can power a flash burst.

red, green, and blue—*See* RGB.

relative aperture—Diameter of the aperture divided by the focal length of the lens. This is expressed numerically as an f-stop.

release-priority AF—A camera mode option in which the shutter can be released at any time, whether the subject is in focus or not. This is used in fast-moving situations where you don't want to lose any of the action due to shutter release delay.

resolution—The ability to reproduce small details in a photograph. Resolving power measures lens performance using line pairs per millimeter (1/mm) and indicates how many black pairs of lines placed at equal intervals within 1 mm can be resolved by a lens. This is also known as resolving power.

resolving power—*See* resolution.

retouching—Altering a finished print, digital image, or piece of film to cover up unwanted spots, marks, or elements.

RGB (red, green, and blue)—The three colors to which the human visual system, digital cameras, and many other devices are sensitive; the colors that are used in displays and input devices. These colors represent the additive color model, where 0 percent of each component yields black, and 100 percent of each component yields white.

sharpness—The amount of detail that you can perceive in an image, or its focus and contrast. It's the combination of resolution (which is typically measured in terms of the number of distinguishable line pairs per millimeter) and acutance.

shutter—Blades, a curtain, plate, or some other mechanical device in a camera that controls the time that light is permitted to reach the film.

shutter priority—A camera automatic exposure mode that allows a photographer to choose the shutter speed while an electronic processor in the camera adjusts the aperture for best exposure.

shutter speed—The amount of time that the shutter stays open. The shutter speed controls the amount of time that light is allowed to expose the image on the film or sensor.

single lens reflex (SLR) camera—A camera in which the image formed by the lens is reflected by a mirror onto a ground-glass screen for viewing purposes. With this camera, you can view the scene through the same lens that takes the picture.

single servo auto focus (AF)—When the subject comes into focus, the focus operation stops and stays locked as long as the shutter release button is lightly depressed. Single servo AF mode is commonly used when shooting stationary objects.

skylight filter—Filter that removes more UV light (and therefore excessive blue) than a UV filter, adding a slight warming tone in two grades—1A and 1B—where B is the warmer one.

slave—A light-sensitive trigger device that synchronizes strobes or flashes without an electronic synch cord.

slide—*See* positive.

slow lens—A lens that has a small aperture (such as f/8), which allows you to use a slower shutter speed than when using a fast lens.

speed winder—*See* motor drive.

strobe—A high-intensity flashing beam of light produced by charging a capacitor to a high voltage and then discharging it as a high-intensity flash of light in a tube.

Tagged Image File Format—*See* TIFF.

teleconverter—A device, consisting of optical glass, that increases the effective focal length of a lens. Mounted between the camera and the lens, a teleconverter typically is available in two different sizes: 1.4X and 2.0X. A 1.4X teleconverter increases focal length by 1.4 times, whereas a 2.0X teleconverter increases focal length by 2.0 times. The aperture of the lens is increased by the same amount as the focal length. For example, a 2.0X teleconverter increases the focal length of a 300-mm lens to 600 mm; however, if the aperture of lens is f/2.8, then it is automatically decreased to f/5.6.

telephoto lens—A lens that has a focal length that is longer than the diagonal of the film format being used. A telephoto lens makes a subject appear larger on film than does a normal lens at the same camera-to-subject distance. It has a narrower field of view than a normal lens does.

through the lens—*See* TTL.

thumbnail—A small version of a digitized image. Image browsers and image editors commonly like to display thumbnails of several photos at a time. In Windows XP's My Pictures, you can view thumbnails of photos in both the thumbnails and filmstrip view modes. Camera Bits' image browser, Photo Mechanic, displays all images as thumbnails that you can then enlarge for better viewing.

TIFF (Tagged Image File Format)—An uncompressed, no-loss image format.

tone—The strength of grays between black-and-white values in an image.

transparency—*See* positive.

TTL (through the lens)—Automatic flash output control, which uses a light sensor to measure the flash intensity and is read through the lens as reflected by the subject. The result is the flash turning off at the correct exposure.

underexposure—Allowing too little light to reach a photo-sensitive material. The result is a thin or light image with negative material and a dark or dense image with reversal material, such as slide film.

variable focus lens or variable focal length lens—A zoom lens that has a focal length capable of varying from 28 to 100 mm, from landscapes to portraits.

white balance—The technical method for digital cameras to adapt to the color temperature of the dominant light source in a scene. It's the way in which a digital camera compensates and determines the different colors that are being emitted by the source of light.

wide-angle lens—A lens that has a focal length that is less than the diagonal of the film format it's being used with. This lens has a shorter focal length and a wider field of view than a normal lens.

zoom lens—A lens that has an adjustable focal length (70–200 mm), which allows for a closer or farther view of a subject. It changes the magnification, not the perspective.

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